पहली कक्षा के लिए गणित की पाठ्यपुस्तक

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

प्रथम संस्करण

फरवरी 2006 माघ 1927

PD 30T NSY

एन.सी.ई.आर.टी. के प्रकाशन विभाग के कार्यालय

एन.सी.ई.आर.टी. कैंपस
श्री अरविंद मार्ग
नयी दिल्ली 110 016

108, 100 फीट रोड
हेली एक्सटेंशन, होस्डेकेरे
बनाशंकरी III इस्टेज
बैंगलूर 560 085

नवजीवन ट्रस्ट भवन
डाकघर नवजीवन
अहमदाबाद 380 014

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निकट: धनकल बस स्टॉप
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सी.डब्ल्यू.सी. कॉम्प्लैक्स
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गुवाहाटी 781021

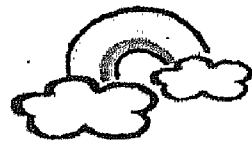
एन.सी.ई.आर.टी. वाटरमार्क 80 जी.एस.एम. पेपर पर मुद्रित।

प्रकाशन विभाग में सचिव, राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्, श्री अरविंद मार्ग, नई दिल्ली 110 016 द्वारा प्रकाशित तथा राष्ट्रीय प्रिंटर्स, एफ–27/487, जुल्फे बंगाल, दिलशाद गार्डन, शाहदरा, दिल्ली 110 095 द्वारा मुद्रित।

प्रकाशन सहयोग

अध्यक्ष, प्रकाशन विभाग : *पी.राजाकुमार*
मुख्य उत्पादन अधिकारी : *शिव कुमार*
मुख्य संपादक : *श्वेता उप्पल*
मुख्य व्यापार अधिकारी : *गौतम गांगुली*
संपादक : नरेश यादव
उत्पादन सहायक : सुनील कुमार

आवरण, चित्र और सज्जा

निधि वाधवा

राष्ट्रीय पाठ्यचर्या की रूपरेखा (2005) सुझाती है कि बच्चों के स्कूली जीवन को बाहर के जीवन से जोड़ा जाना चाहिए। यह सिद्धांत किताबी ज्ञान की उस विरासत के विपरीत है जिसके प्रभाववश हमारी व्यवस्था आज तक स्कूल और घर के बीच अंतराल बनाए हुए है। नयी राष्ट्रीय पाठ्यचर्या पर आधारित पाठ्यक्रम और पाठ्यपुस्तकें इस बुनियादी विचार पर अमल करने का प्रयास हैं। इस प्रयास में हर विषय को एक मज़बूत दीवार से घेर देने और जानकारी को रटा देने की प्रवृत्ति का विरोध शामिल है। आशा है कि ये कदम हमें राष्ट्रीय शिक्षा नीति (1986) में वर्णित बाल-केंद्रित व्यवस्था की दिशा में काफ़ी दूर तक ले जाएँगे।

इस प्रयत्न की सफलता अब इस बात पर निर्भर है कि स्कूलों के प्राचार्य और अध्यापक बच्चों को कल्पनाशील गतिविधियों और सवालों की मदद से सीखने और सीखने के दौरान अपने अनुभवों पर विचार करने का कितना अवसर देते हैं। हमें यह मानना होगा कि यदि जगह, समय और आज़ादी दी जाए तो बच्चे बड़ों द्वारा सौंपी गई सूचना-सामग्री से जुड़कर और जूझकर नए ज्ञान का सृजन करते हैं। शिक्षा के विविध साधनों एवं स्रोतों की अनदेखी किए जाने का प्रमुख कारण पाठ्यपुस्तक को परीक्षा का एकमात्र आधार बनाने की प्रवृत्ति है। सर्जना और पहल को विकसित करने के लिए ज़रूरी है कि हम बच्चों को सीखने की प्रक्रिया में पूरा भागीदार मानें और बनाएँ, उन्हें ज्ञान की निर्धारित खुराक का ग्राहक मानना छोड़ दें।

ये उद्देश्य स्कूल की दैनिक ज़िंदगी और कार्यशैली में काफ़ी फेरबदल की माँग करते हैं। दैनिक समय-सारणी में लचीलापन उतना ही ज़रूरी है जितना वार्षिक कैलेण्डर के अमल में चुस्ती, जिससे शिक्षण के लिए नियत दिनों की संख्या हकीकत बन सके। शिक्षण और मूल्यांकन की विधियाँ भी इस बात को तय करेंगी कि यह पाठ्यपुस्तक स्कूल में बच्चों के जीवन को मानसिक दबाव तथा बोरियत की जगह खुशी का अनुभव बनाने में कितनी प्रभावी सिद्ध होती है।

बोझ की समस्या से निपटने के लिए पाठ्यक्रम निर्माताओं ने विभिन्न चरणों में ज्ञान का पुनर्निर्धारण करते समय बच्चों के मनोविज्ञान एवं अध्यापन के लिए उपलब्ध समय का ध्यान रखने की पहले से अधिक सचेत कोशिश की है। इस कोशिश को और गहराने के यत्न में यह पाठ्यपुस्तक सोच-विचार और विस्मय, छोटे समूहों में बातचीत एवं बहस और हाथ से की जाने वाली गतिविधियों को प्राथमिकता देती है।

एन.सी.ई.आर.टी. इस पुस्तक की रचना के लिए बनाई गई पाठ्यपुस्तक निर्माण समिति के परिश्रम के लिए कृतज्ञता व्यक्त करती है। परिषद् प्राथमिक पाठ्यपुस्तक सलाहकार समूह की अध्यक्ष, प्रोफ़ेसर अनीता रामपाल और गणित पाठ्यपुस्तक समिति के मुख्य सलाहकार, डॉ. रोहित धनकर की विशेष आभारी है। इस पाठ्यपुस्तक के विकास में कई शिक्षकों ने योगदान किया, इस योगदान को संभव बनाने के लिए हम उनके प्राचार्यों के आभारी हैं। हम उन सभी संस्थाओं और संगठनों के प्रति कृतज्ञ हैं जिन्होंने अपने संसाधनों, सामग्री तथा सहयोगियों की मदद लेने में हमें उदारतापूर्वक सहयोग दिया। हम माध्यमिक एवं उच्च शिक्षा विभाग, मानव संसाधन विकास मंत्रालय द्वारा प्रोफ़ेसर मृणाल मीरी एवं प्रोफ़ेसर जी.पी. देशपांडे की अध्यक्षता में गठित निगरानी समिति (मॉनिटरिंग कमेटी) के सदस्यों को अपना मूल्यवान समय और सहयोग देने के लिए धन्यवाद देते हैं। व्यवस्थागत सुधारों और अपने प्रकाशनों में निरंतर निखार लाने के प्रति समर्पित एन.सी.ई.आर.टी. टिप्पणियों एवं सुझावों का स्वागत करेगी जिनसे भावी संशोधनों में मदद ली जा सके।

निदेशक
राष्ट्रीय शैक्षिक अनुसंधान और
प्रशिक्षण परिषद्

नई दिल्ली
20 दिसंबर 2005

पाठ्यपुस्तक निर्माण समिति

अध्यक्ष, प्राइमरी पाठ्यपुस्तक सलाहकार समिति

अनीता रामपाल, *प्रोफ़ेसर,* केंद्रीय शिक्षा संस्थान, दिल्ली विश्वविद्यालय

मुख्य सलाहकार

रोहित धनकर, *निदेशक,* दिगांतर, जयपुर

सदस्य

अस्मीता वर्मा, *प्राथमिक शिक्षक,* नवयुग विद्यालय, लोधी कॉलोनी, नई दिल्ली

विनोद चन्द्र ओझा, *प्राथमिक शिक्षक,* फतेह पब्लिक स्कूल, सवाई माधोपुर, राजस्थान

गीता महाशब्दो, नवनिर्मिति, पवई म्युनिसिपल हॉस्पिटल, पवई, मुंबई

एल.के भोपा, *प्रवक्ता,* क्षेत्रीय शिक्षा संस्थान, भुवनेश्वर, उड़ीसा

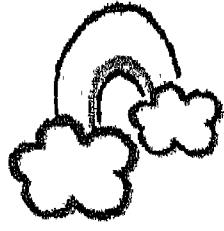
एम.शारदा, *टी.जी.टी.,* बहुउद्देश्यीय निदर्शन विद्यालय, क्षेत्रीय शिक्षा संस्थान, मैसूर

एन.हारिनी, *प्राथमिक शिक्षक,* बहुउद्देश्यीय निदर्शन विद्यालय, क्षेत्रीय शिक्षा संस्थान, मैसूर

हिंदी रूपांतरण

दीप्ति शर्मा, *प्राथमिक शिक्षक,* केंद्रीय शिक्षा संस्थान, दिल्ली विश्वविद्यालय

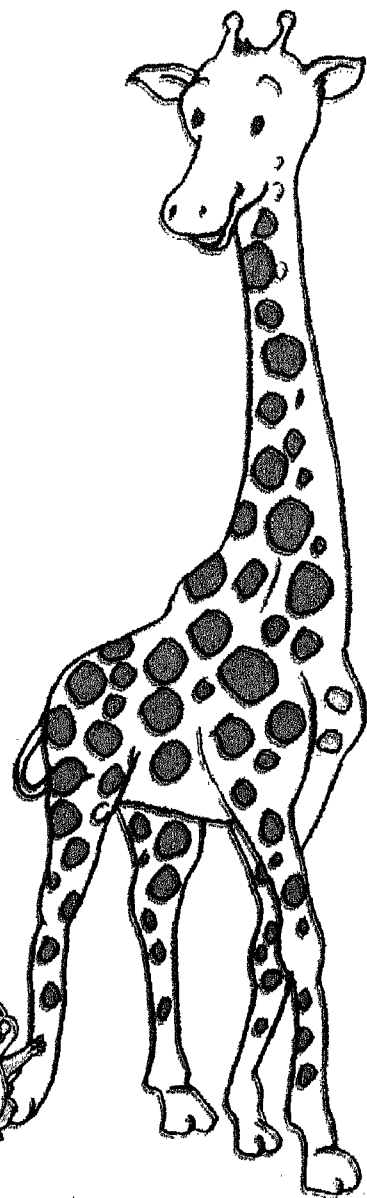
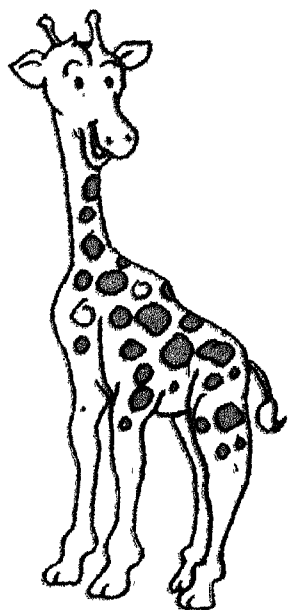
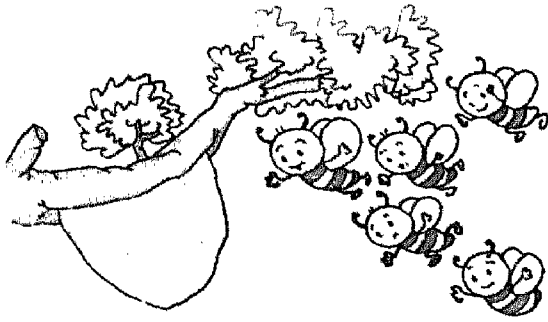
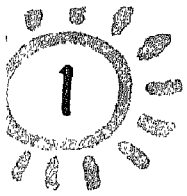
सदस्य-समन्वयक

सुरजा कुमारी, *प्रोफेसर,* प्रारंभिक शिक्षा विभाग, एन.सी.ई.आर.टी., नई दिल्ली

आभार

इस पुस्तक के निर्माण में सहयोग के लिए हम प्रोफेसर कृष्ण कांत वशिष्ठ, अध्यक्ष, प्रारंभिक शिक्षा विभाग, एन.सी.ई.आर.टी. के प्रति विशेष रूप से आभार व्यक्त करते हैं जिन्होंने हर संभव सहयोग दिया।

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद् इस पुस्तक को अंतिम रूप देने के लिए पुनरीक्षण कार्यशाला के सहभागियों के बहुमूल्य सहयोग के लिए कृतज्ञता व्यक्त करती है - मैत्रार सैसमल, *प्राथमिक शिक्षक*, केन्द्रीय विद्यालय, सेक्टर-IV, आर.के.पुरम, नई दिल्ली; रूपिन्दर कौर, *प्राथमिक शिक्षक*, गुरु हरकिशन पब्लिक स्कूल, नई दिल्ली; सुब्रा सिंह, *प्राथमिक शिक्षक*, केन्द्रीय विद्यालय, एन.सी.ई.आर.टी. शाखा, नई दिल्ली; अरुण टी. मावलंकर, होमी भाभा विज्ञान शिक्षा केन्द्र, मुंबई।

पुस्तक के निर्माण के विभिन्न चरणों में सहयोग के लिए परिषद् अरविंद शर्मा, सुबोध और सादिक सईद, *डी.टी.पी. ऑपरेटर*; गोविंद राम उपाध्याय, *कॉपी एडीटर*; दुर्गा देवी, *प्रूफ रीडर*; शाकम्बर दत्त, *कंप्यूटर स्टेशन प्रभारी* की आभारी है। इस पुस्तक के सुरुचिपूर्ण ढंग से प्रकाशन के लिए परिषद् प्रकाशन विभाग, एन.सी.ई.आर.टी. के कार्यों की भी सराहना करती है।

विषय सूची

आकृतियाँ और स्थान

अंदर-बाहर

एक अरब और उसका ऊँट।

सरदी का दिन था। की पीठ पर बैठकर घूमने जा रहा था।

रात को ने अपना तंबू लगाया और उसके अंदर चला गया।

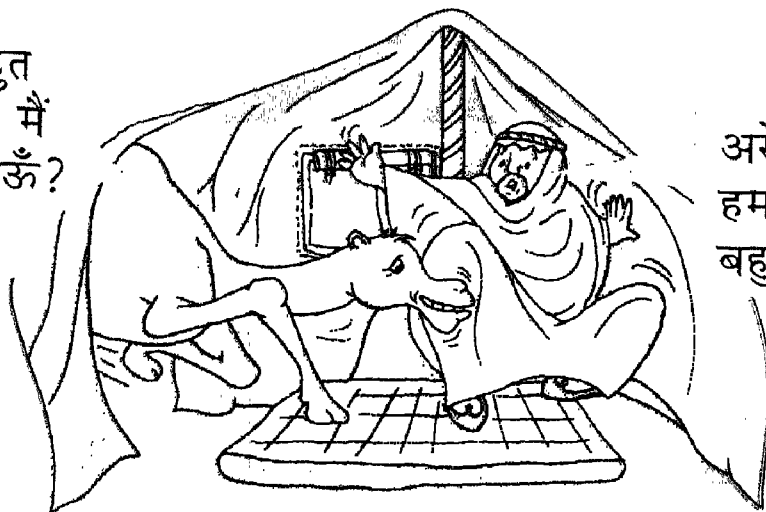
को बाहर ही रहने दिया।

बाहर तो बहुत ठंड
है। क्या मैं अपनी
गर्दन अंदर कर लूँ?

ठीक है! तुम अपनी
गर्दन अंदर कर लो।

बाहर तो बहुत ठंड है। क्या मैं अपनी आगे की टाँगें अंदर कर लूँ?

ठीक है! तुम अपनी आगे की टाँगें भी अंदर कर लो।

बाहर तो बहुत ठंड है। क्या मैं अंदर आ जाऊँ?

अरे! नहीं, यह तंबू हम दोनों के लिए बहुत छोटा है।

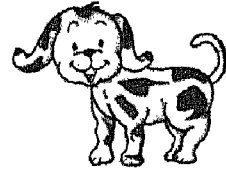
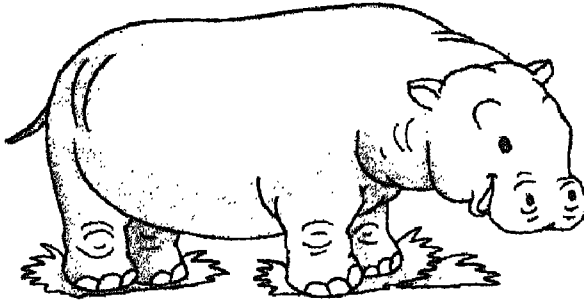
इसलिए मैं अंदर आ रहा हूँ और तुम बाहर जाओ।

ऊँट

अरब

तंबू

उससे बड़ा-उससे छोटा

उससे बड़े पर (✓) निशान लगाइए।

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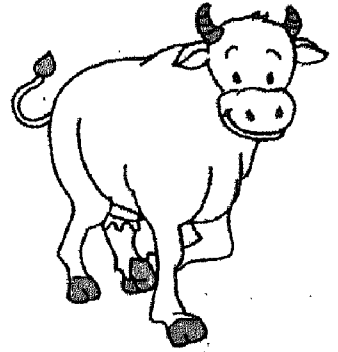
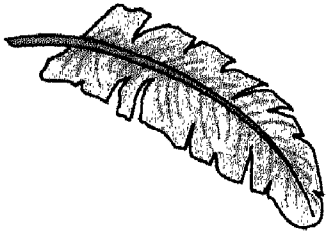
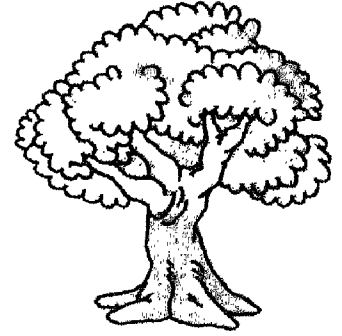
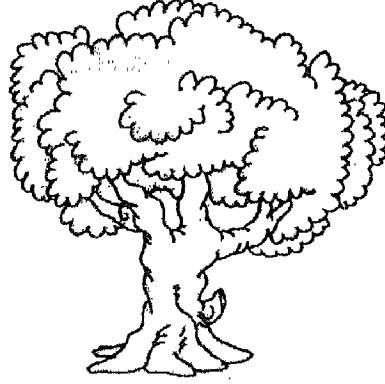
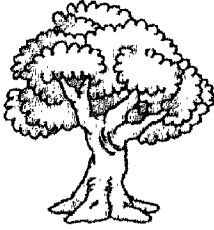
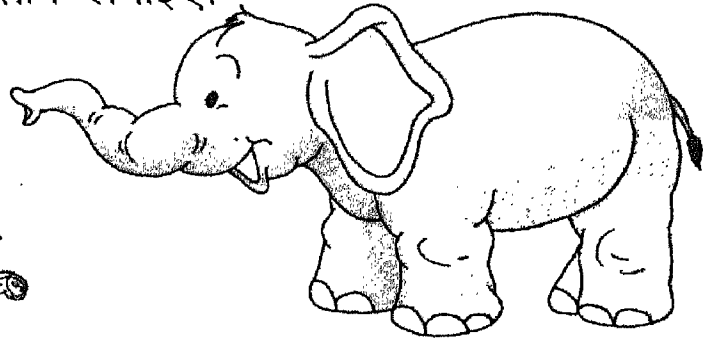
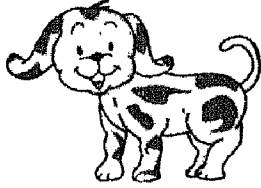
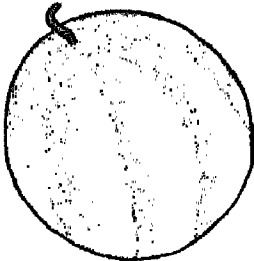
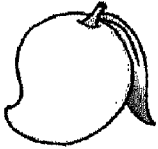
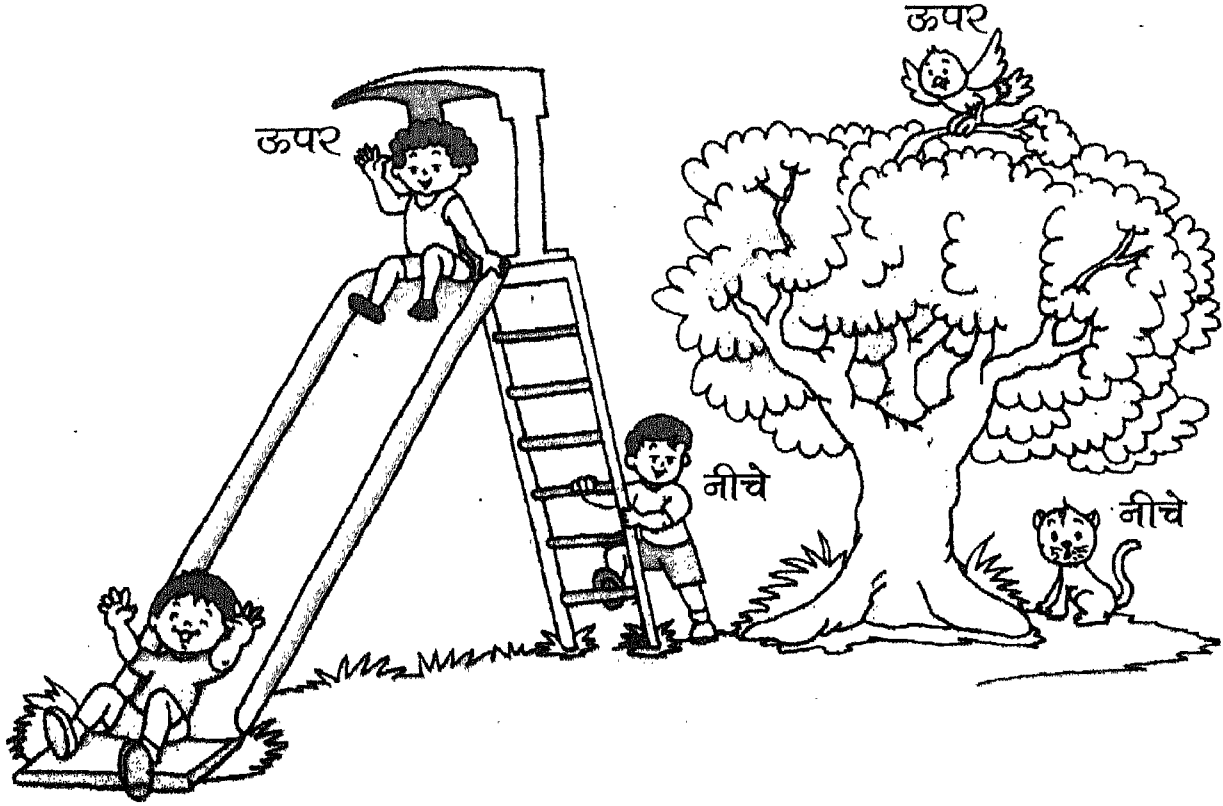
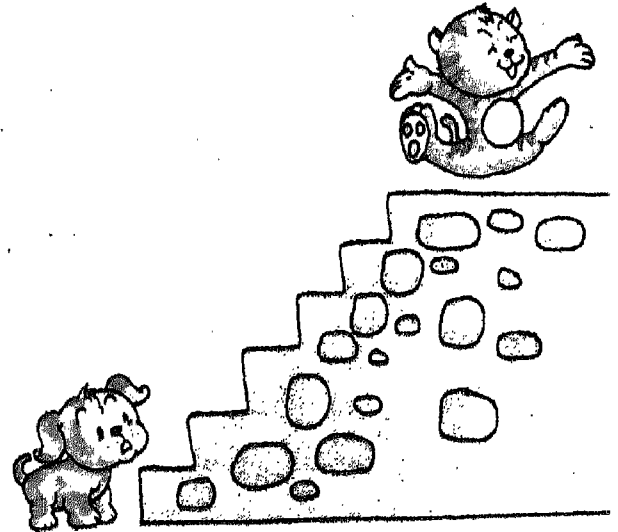

उससे छोटे टायर पर (✓) निशान लगाइए।

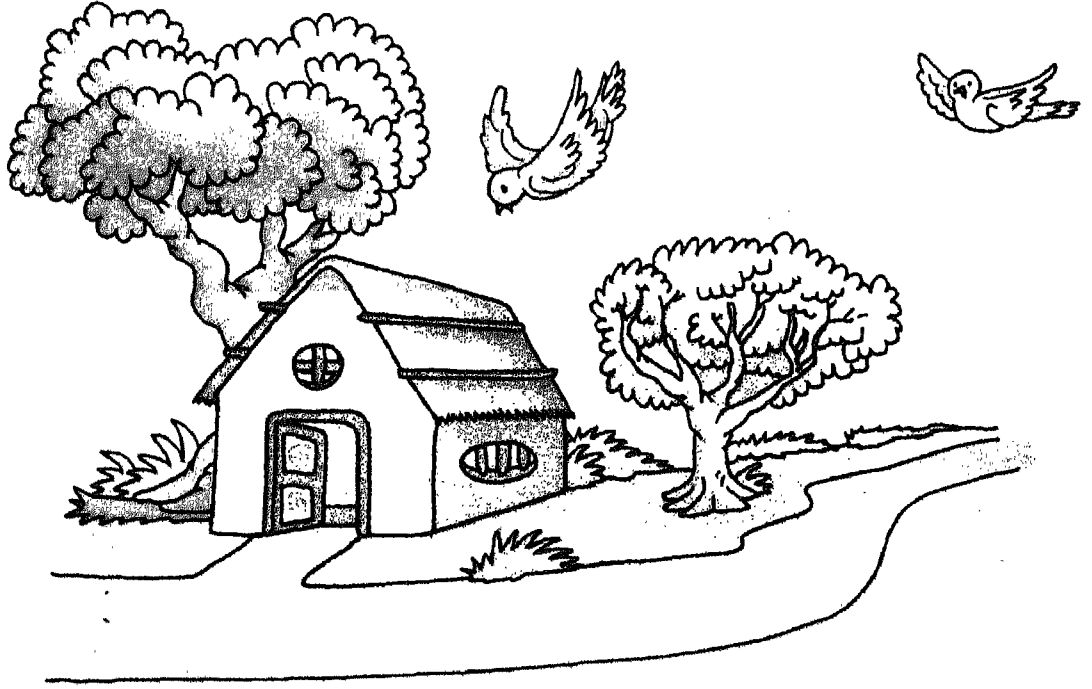
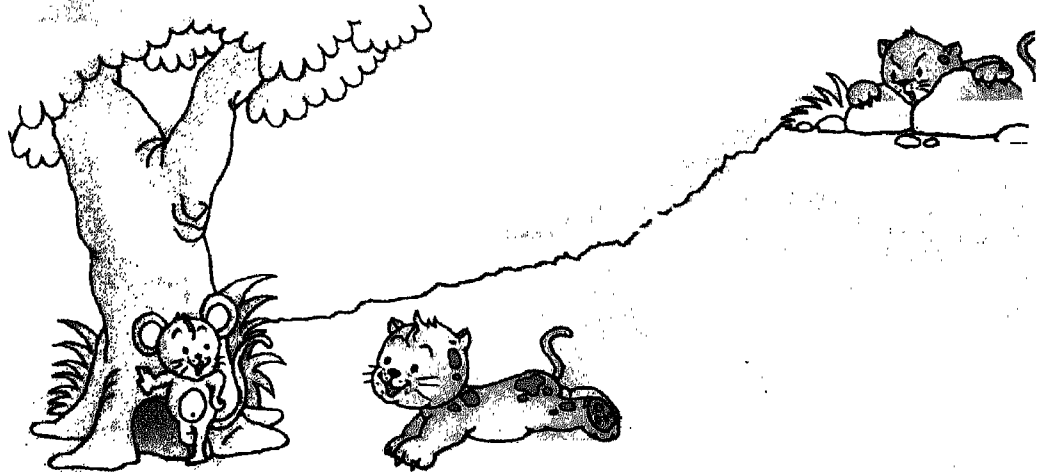
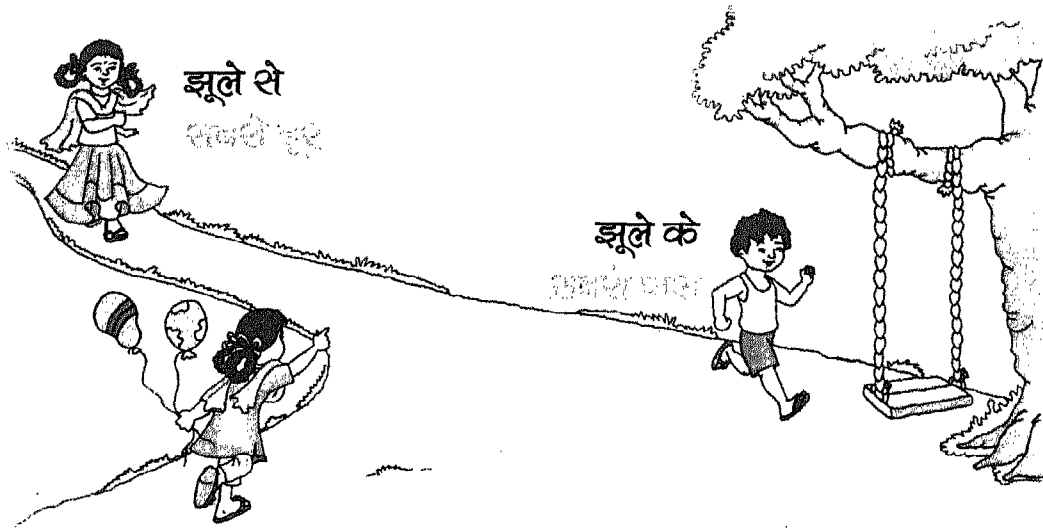
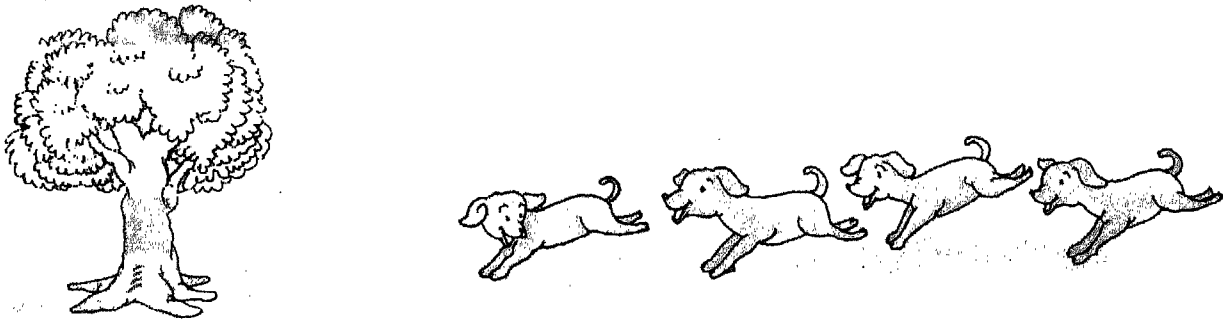
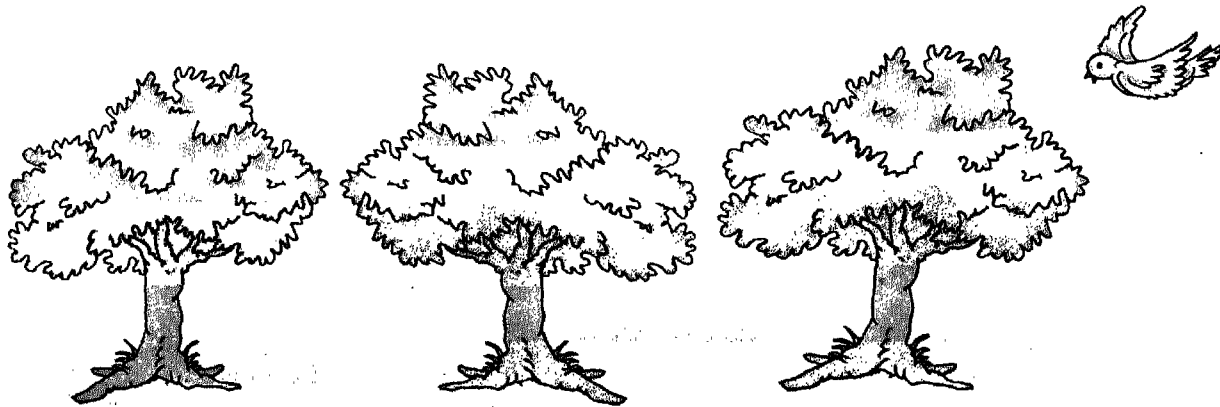
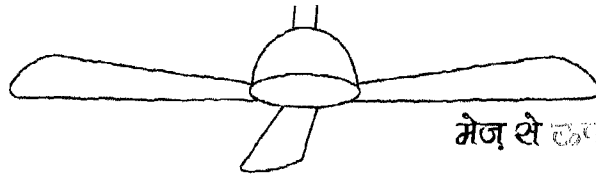
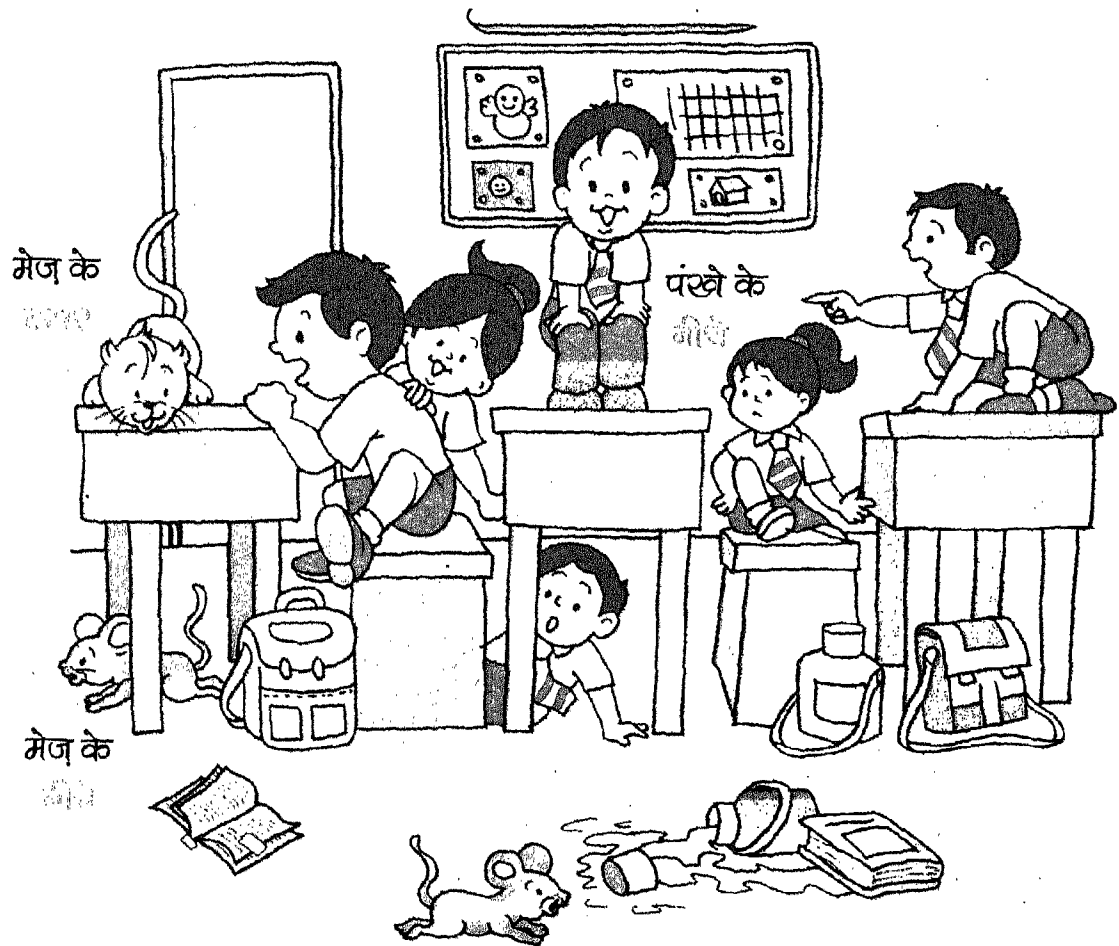
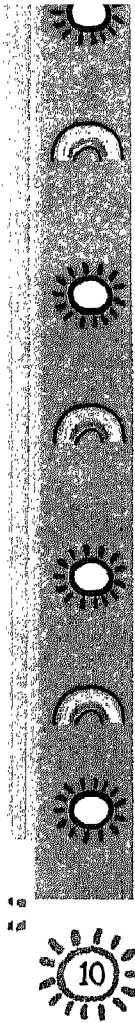
सबसे बड़ा-सबसे छोटा

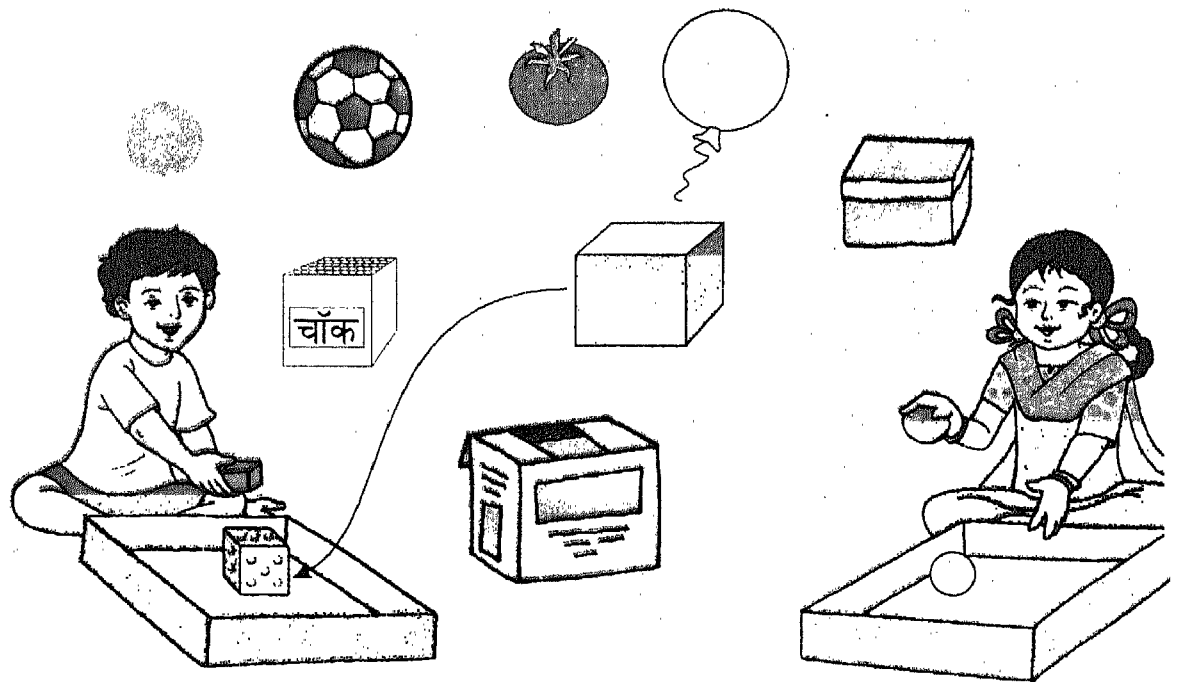
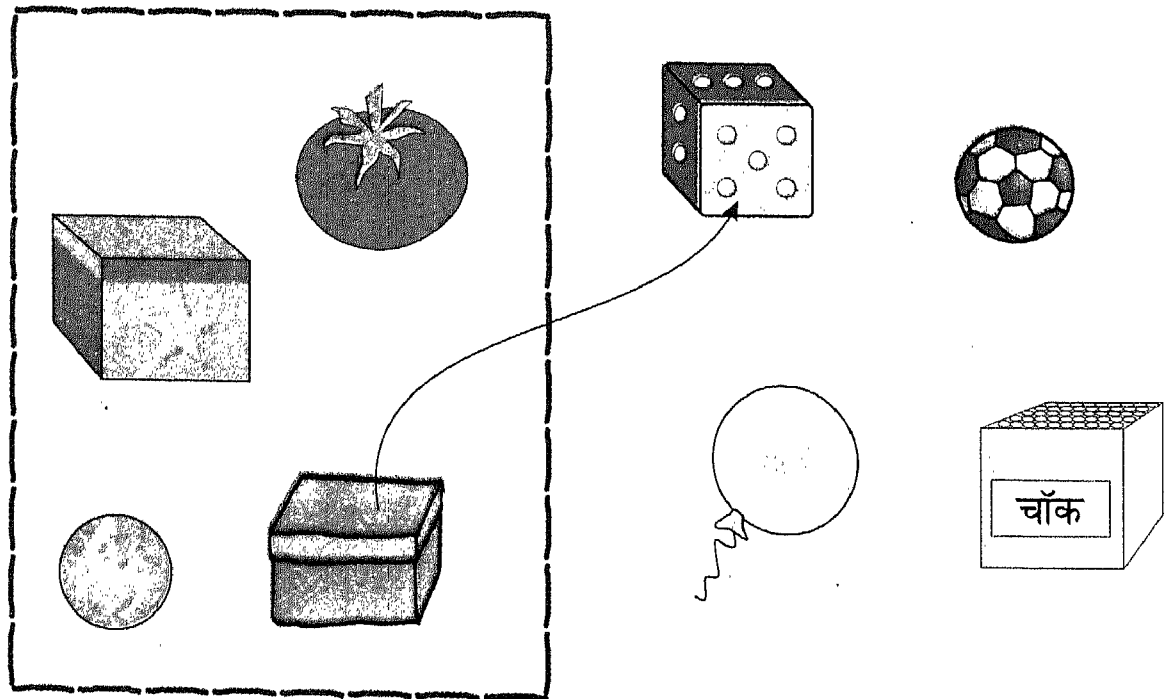
सबसे पेड़ पर ( ) निशान लगाइए।

सबसे जानवर पर ( ) निशान लगाइए।

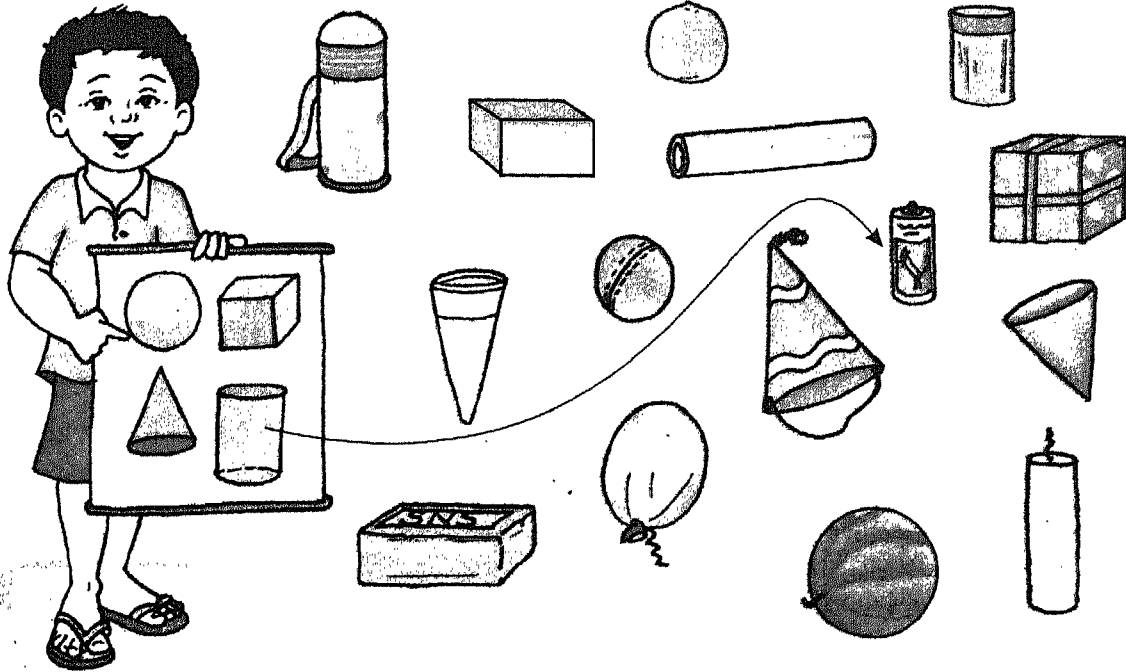
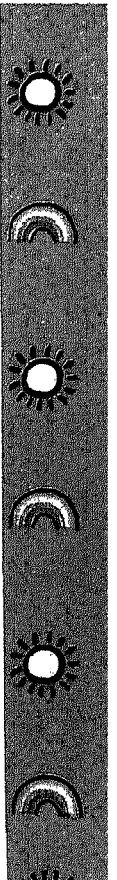
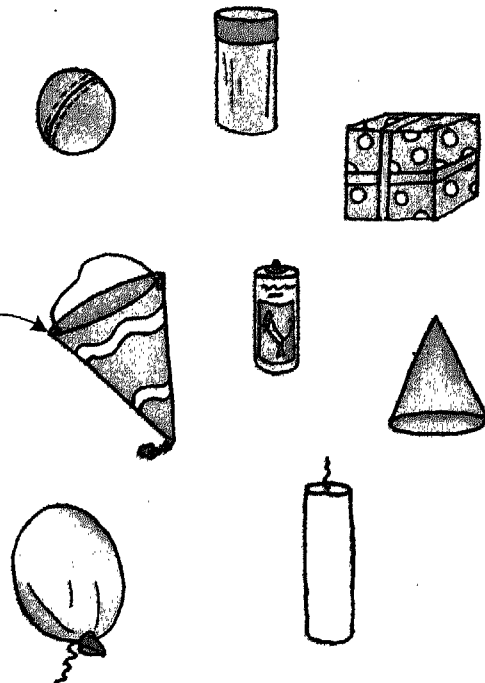
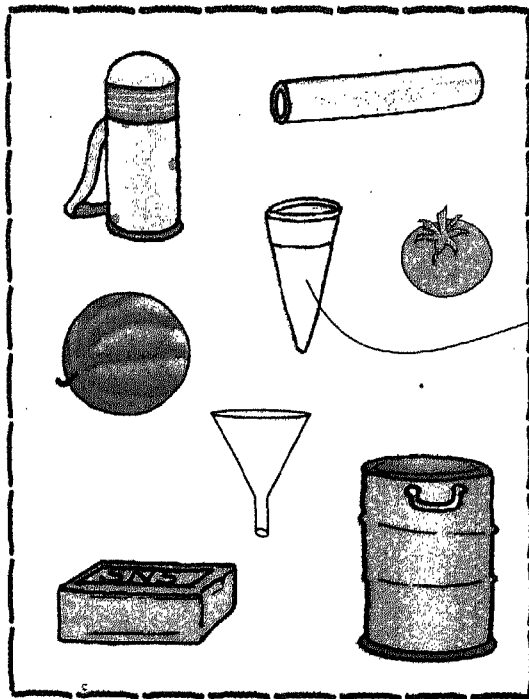
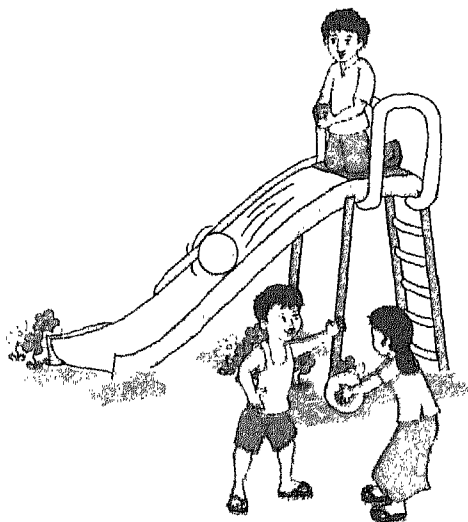
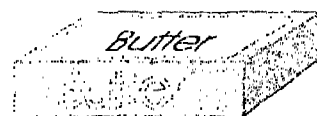
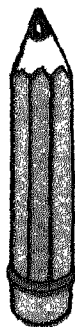
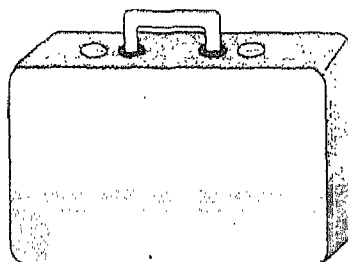
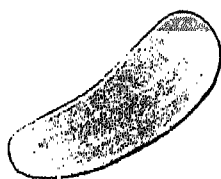
सबसे फल पर ( ) निशान लगाइए।

सबसे बुलबुले पर ( ) निशान लगाइए।

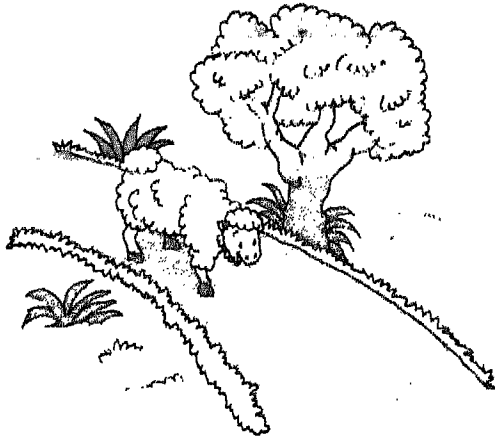
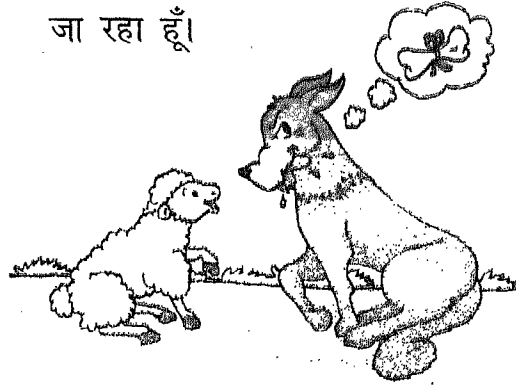
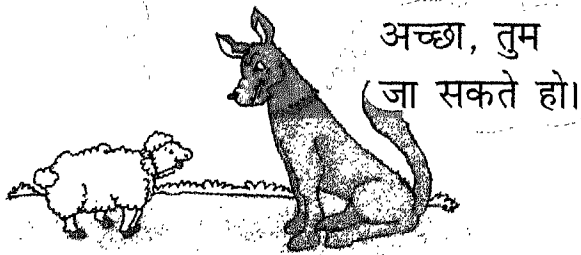
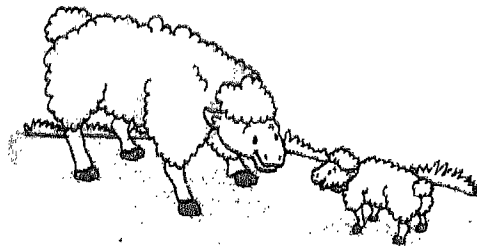
ऊपर-नीचे

ऊपर वाले मटके पर (✓) निशान लगाइए।

सीढ़ियों के नीचे वाले जानवर पर (✓) निशान लगाइए।

पास-दूर

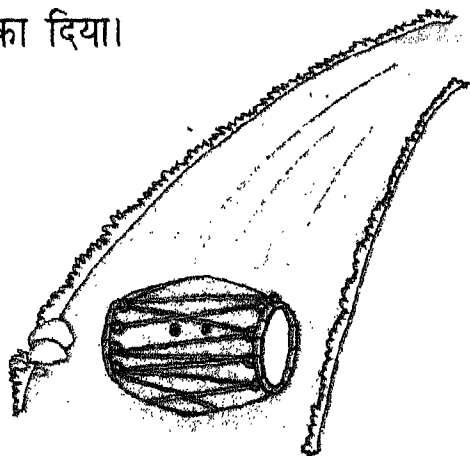
मकान के पास वाली चिड़िया पर (✓) निशान लगाइए।

पेड़ से दूर वाली बिल्ली पर (✓) निशान लगाइए।

सबसे पास-सबसे दूर

पेड़ से सबसे दूर वाले पिल्ले पर (✓) निशान लगाइए।

चिड़िया के सबसे पास वाले पेड़ पर (✓) निशान लगाइए।

ऊपर-नीचे

पास-दूर, ऊपर-नीचे पर चर्चा करें।

हमारे आसपास की आकृतियाँ

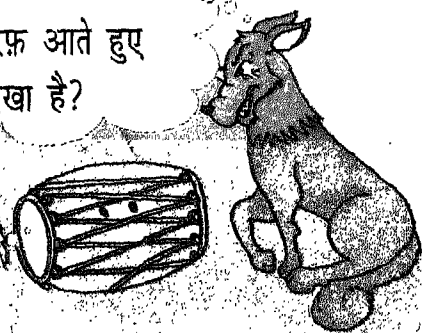
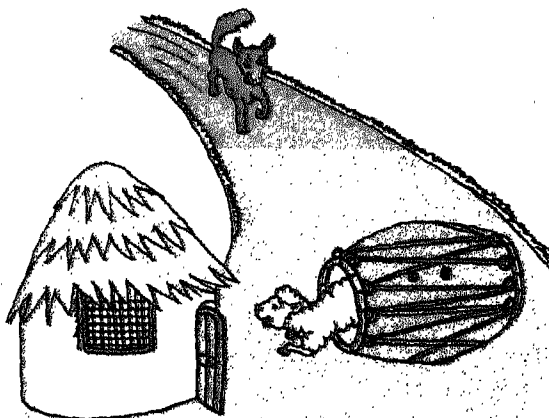
रेखा खींचते हुए आकृतियों को गुलाबी और पीले बॉक्सों में रखिए।

रेखा खींचते हुए एक जैसी आकृतियों का मिलान कीजिए।

छाँटना

एक जैसी आकृतियों से मिलान करते हुए आकृतियाँ छाँटिए।

एक जैसी आकृतियों के जोड़े बनाइए।

लुढ़कना-सरकना

लुढ़कने वाली वस्तुओं पर (✓) निशान लगाइए।

सरकने वाली वस्तुओं पर (✓) निशान लगाइए।

बुद्धिमान दादी

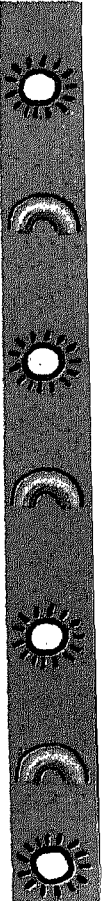
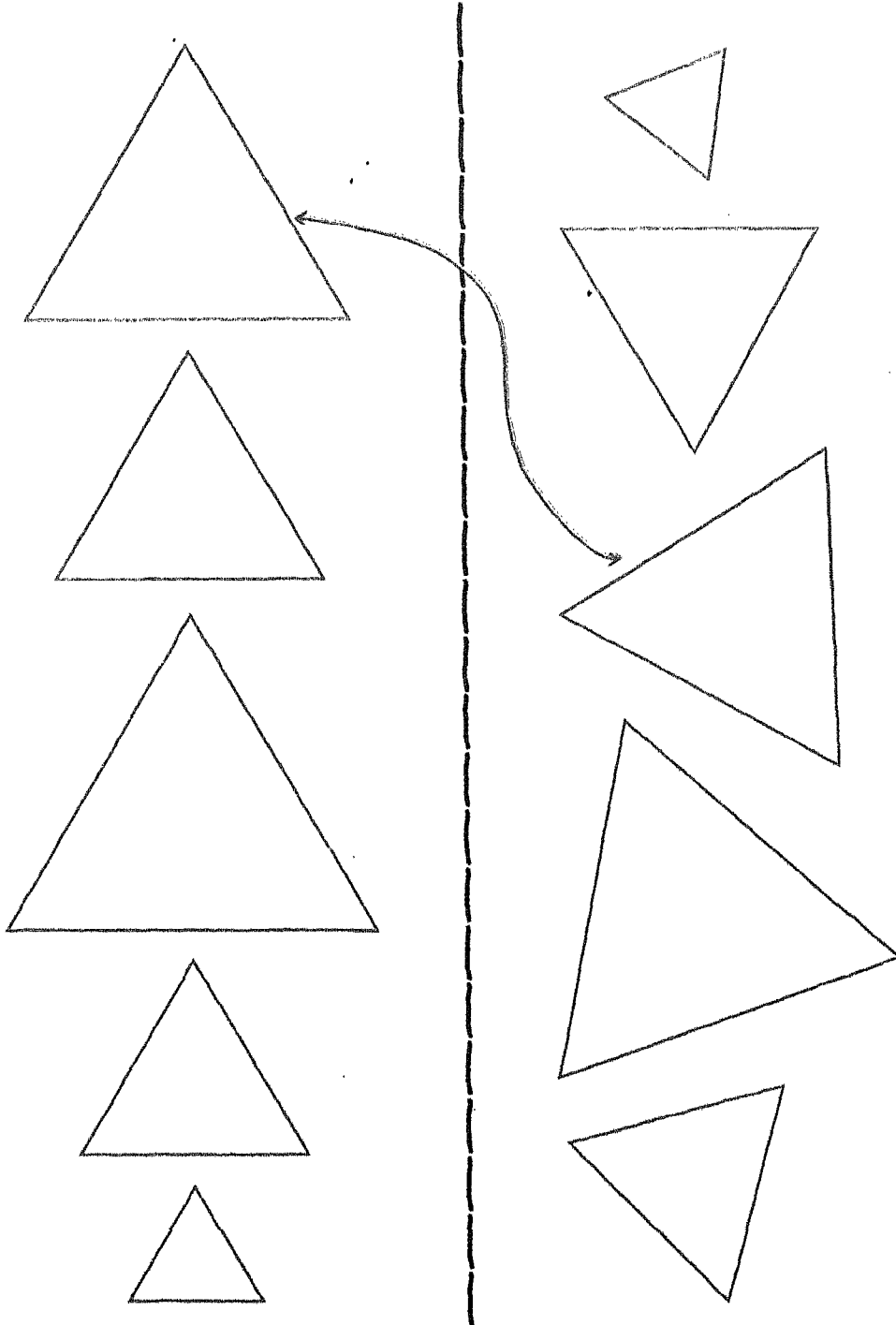
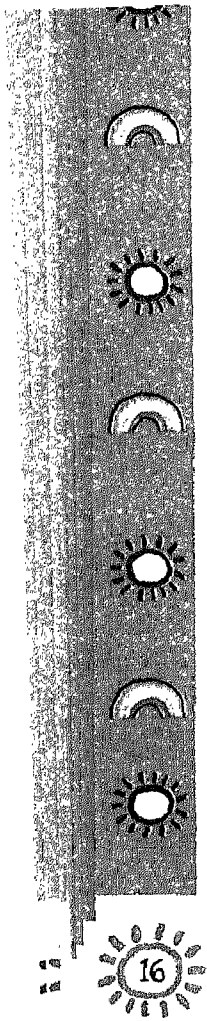
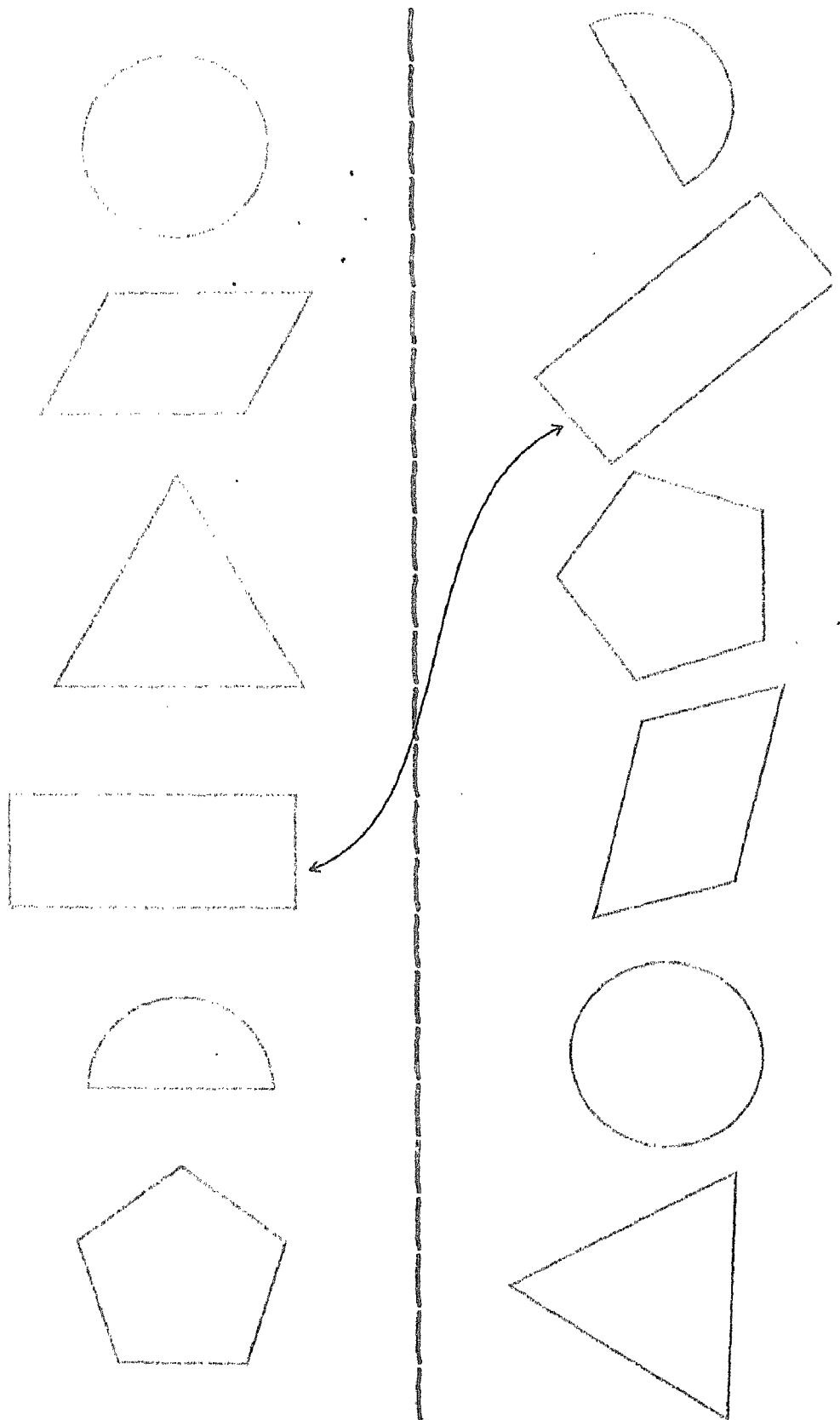
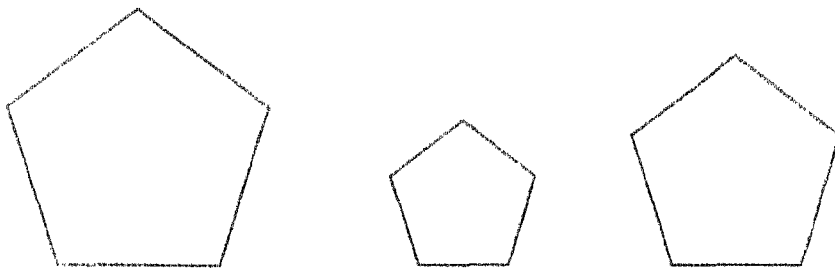
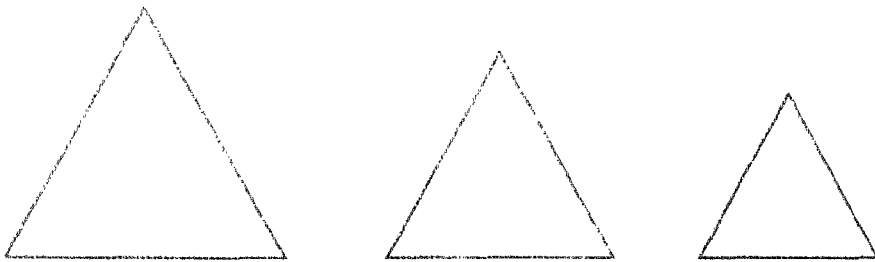
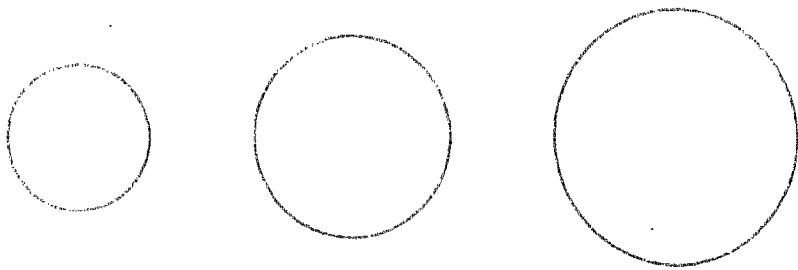
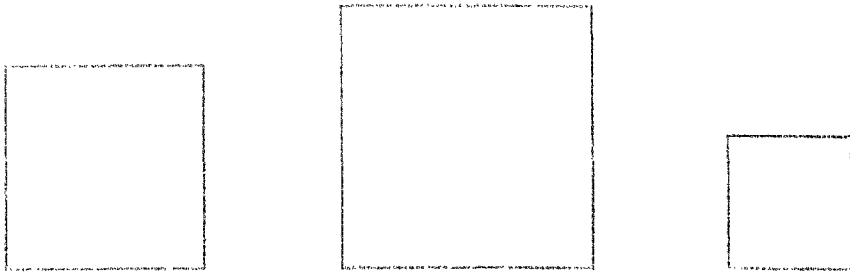
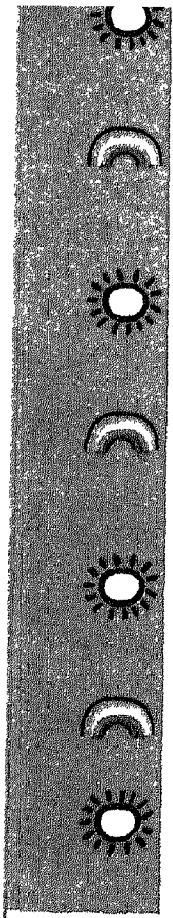
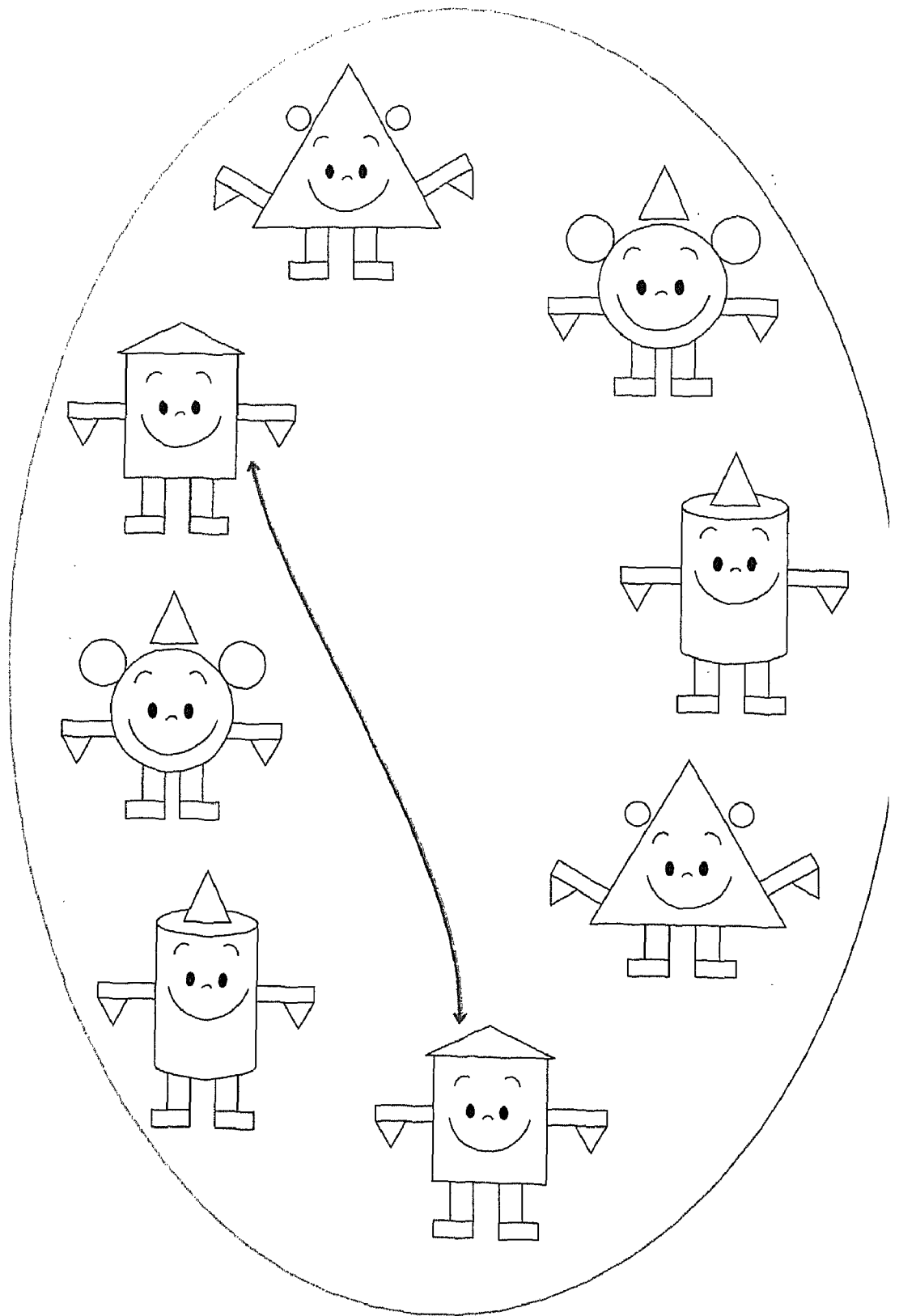
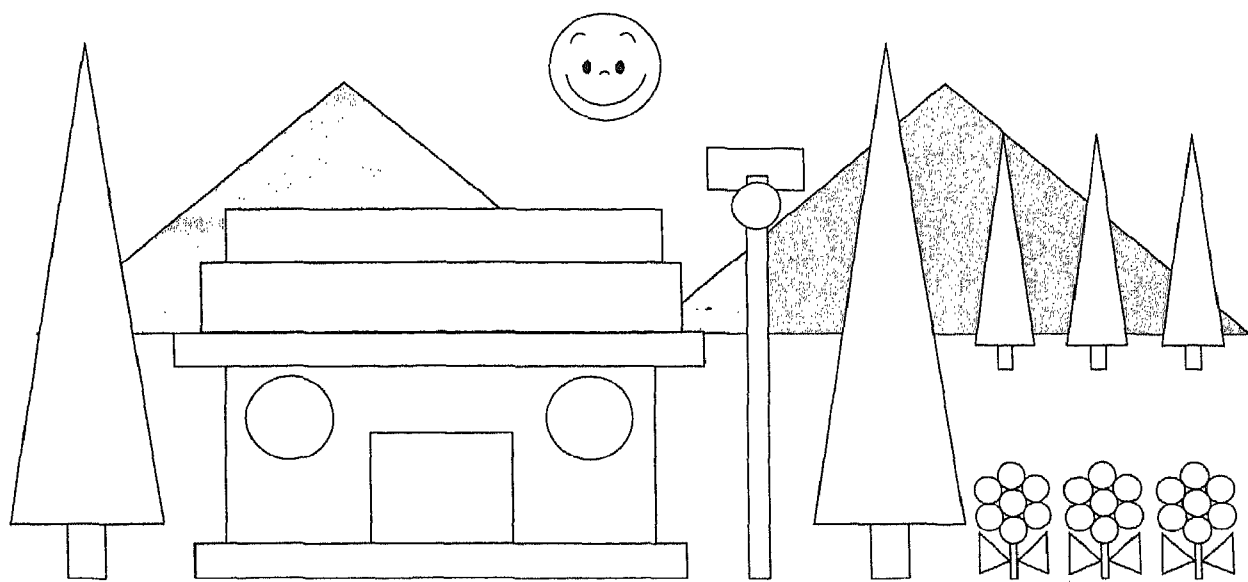
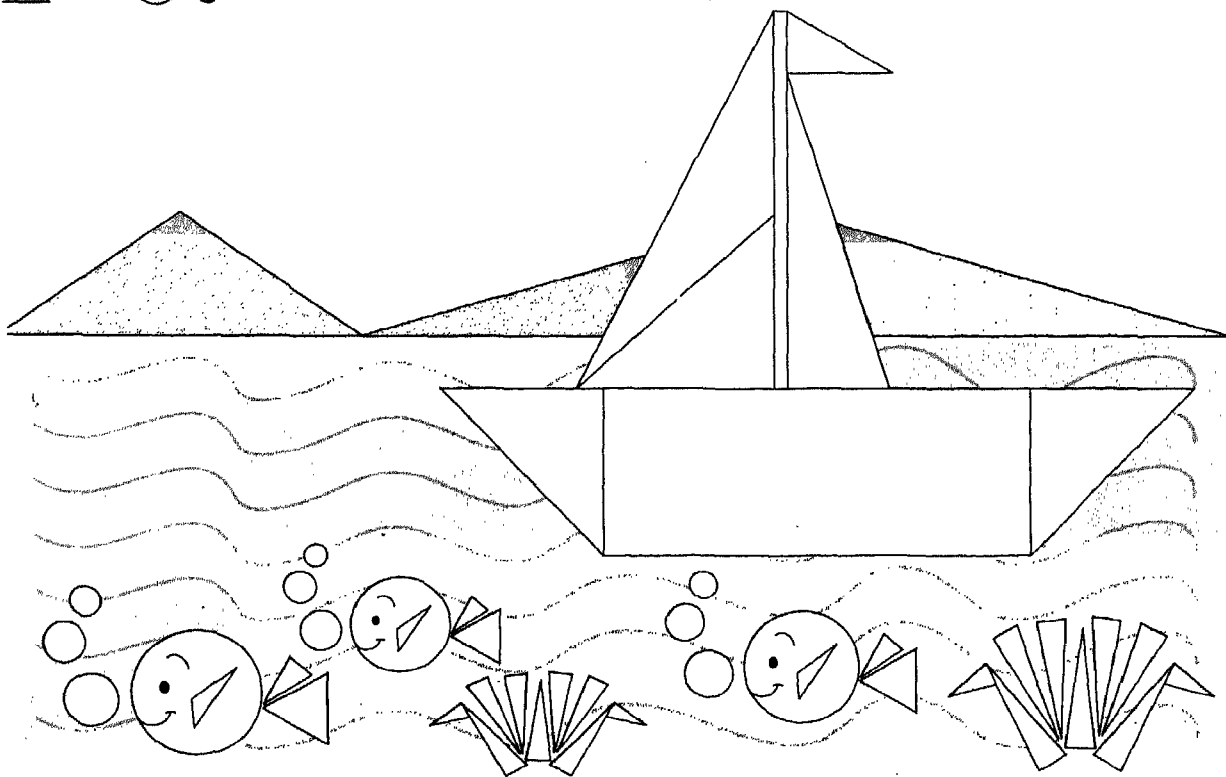
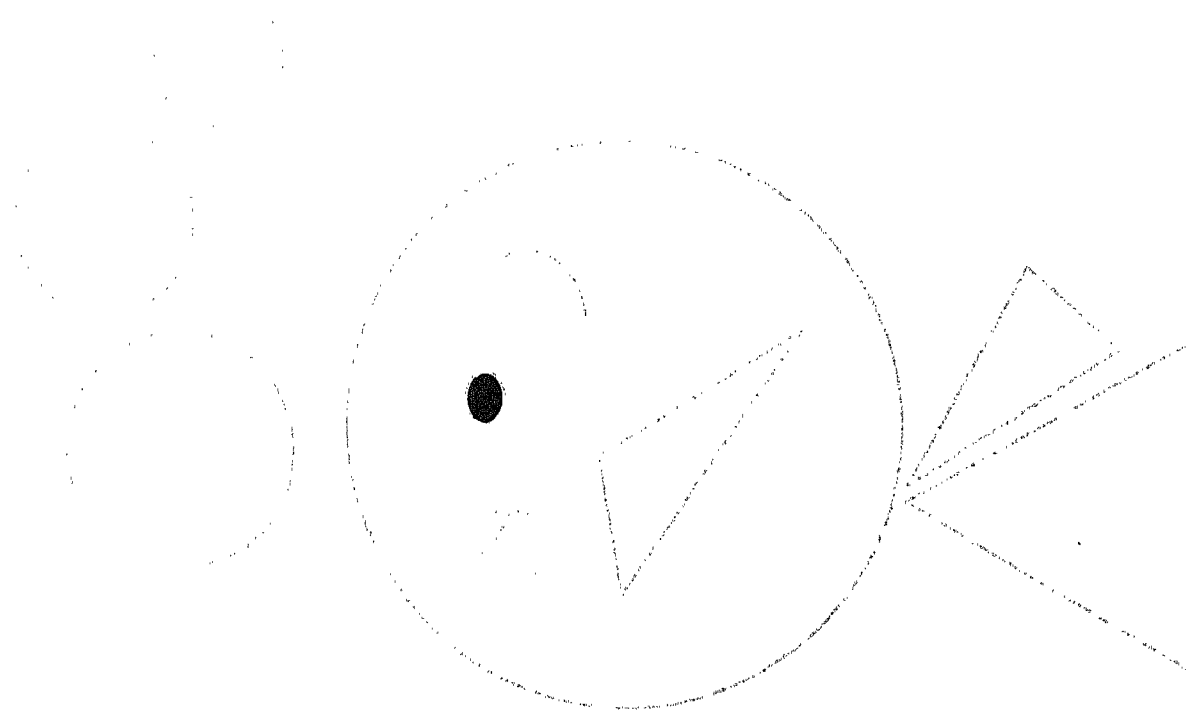
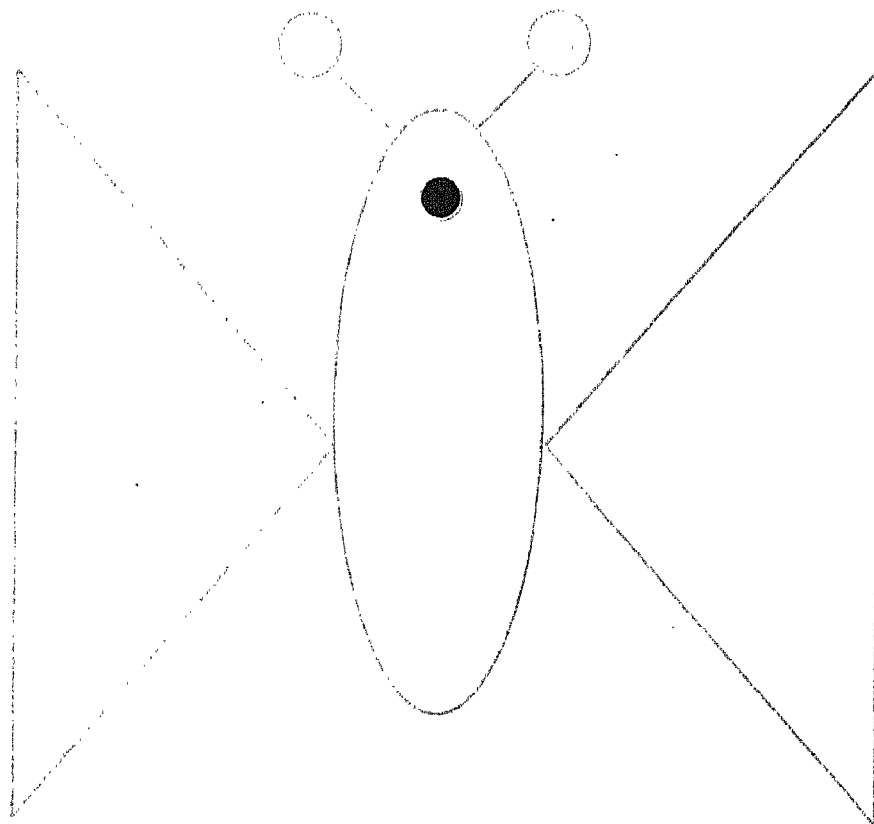
एक मेमना था। वह अपनी दादी माँ से मिलने जा रहा था।

जंगल के रास्ते में उसे एक भेड़िया मिला।

कृपया मुझे जाने दो। मैं अपनी दादी माँ से मिलने जा रहा हूँ। जब मैं वापिस आँऊ तो मुझे खा लेना।

जब वह लौटने लगा, तो उसने दादी माँ को भेड़िये के बारे में बताया।

दादी माँ ने उसे एक उपाय सुझाया।

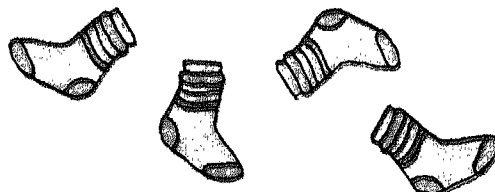
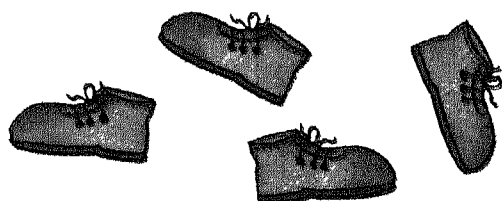
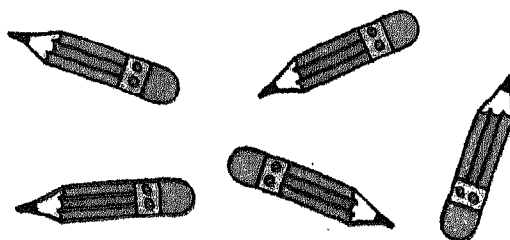
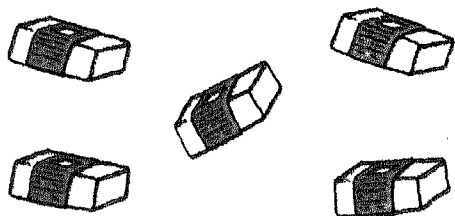
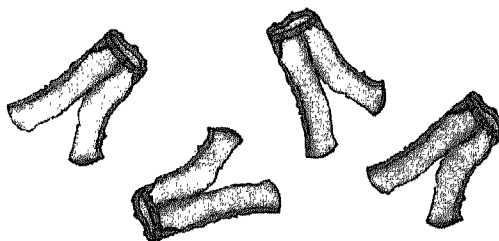
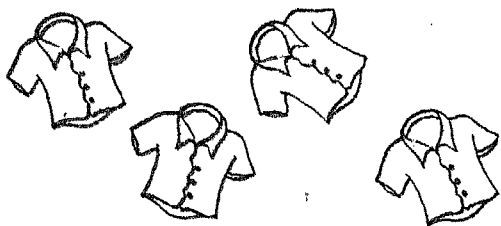
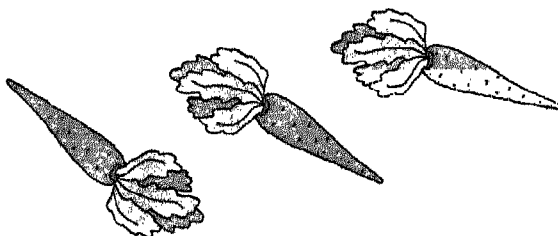
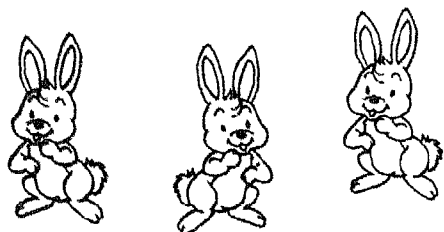
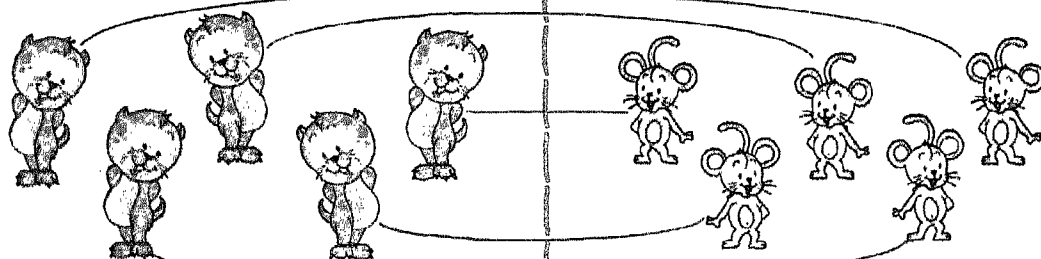
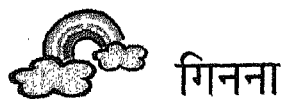
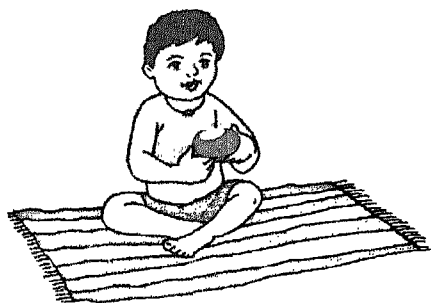
चलो, अपने आपको इस ढोलक में छुपा लो।

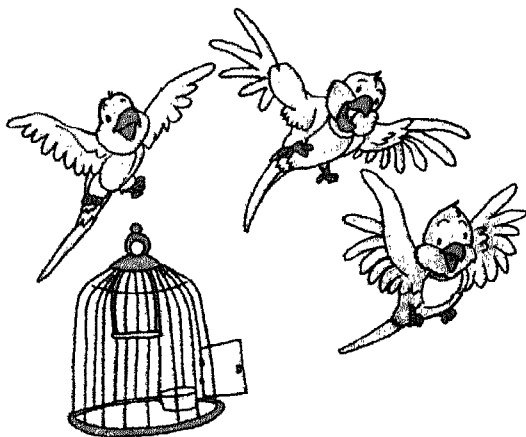
दादी माँ ने ढोलक को सड़क पर लुढ़का दिया।

ढोलक नीचे की ओर लुढ़कने लगी।

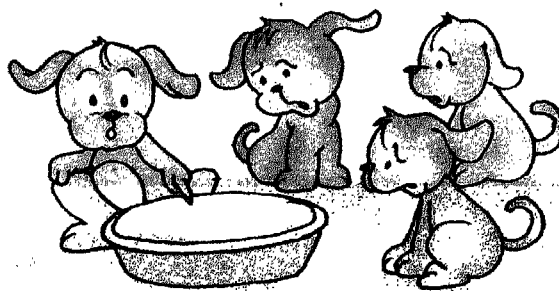
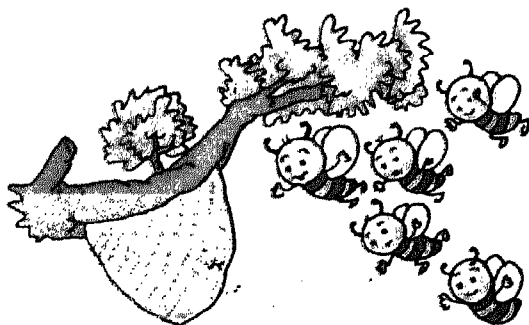
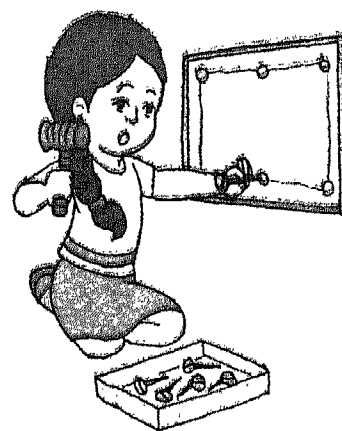
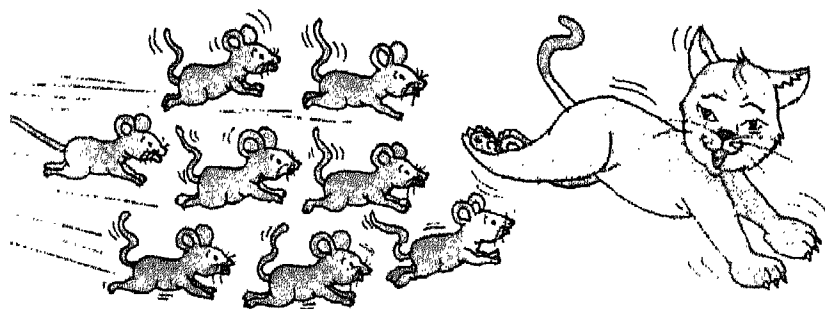
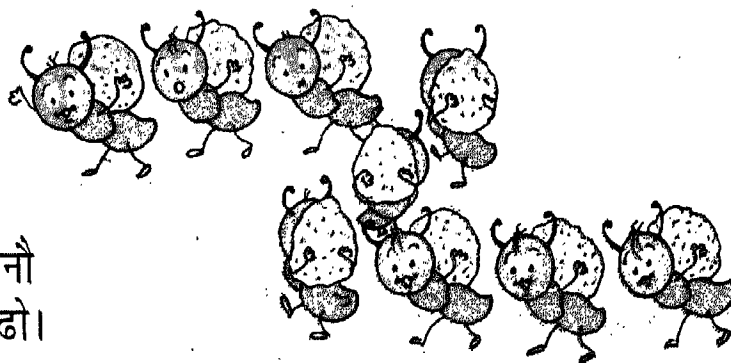
मेमने ने भेड़िये को अपना इंतज़ार करते हुए पाया।

भेड़िये को शक हो गया और वह ढोलक के पीछे-पीछे दौड़ने लगा।

इससे पहले कि भेड़िया उसे पकड़ पाता, मेमना अपने घर पहुँच गया और उसने दादी माँ को धन्यवाद दिया।

आकृतियाँ

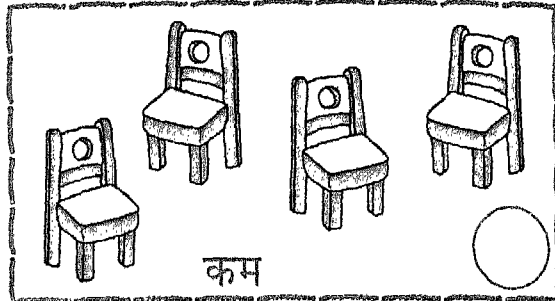
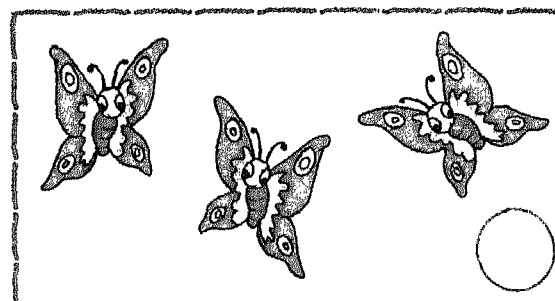
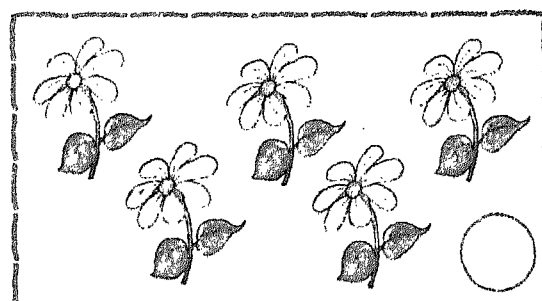
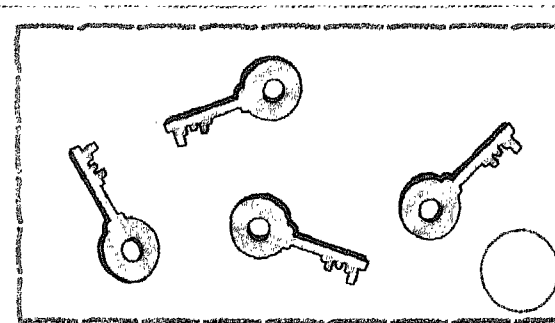
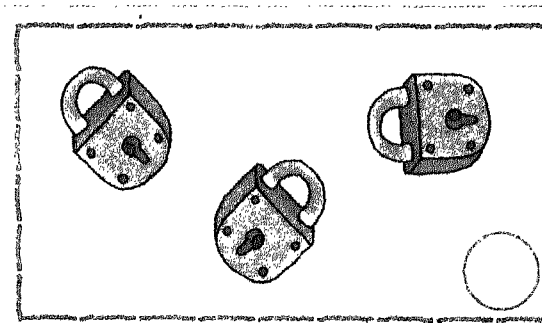
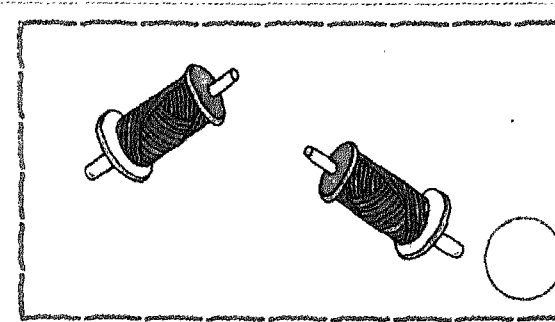
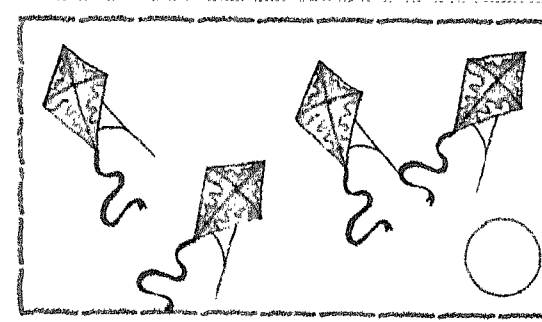
एक जैसे आकार की आकृतियों का मिलान कीजिए।

एक जैसी आकृतियों का मिलान कीजिए।

सबसे छोटी आकृति में रंग भरिए।

एक जैसी आकृतियों का मिलान कीजिए।

△ हरा, ● लाल और ▬ नीला रंग भरिए।

△ हरा, ○ गुलाबी और ▭ पीला रंग भरिए।

पुस्तक के अंत में दी गई आकृति किट की सहायता से एक जैसे चित्र बनाइए।

एक से नौ तक की संख्याएँ

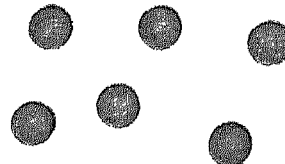
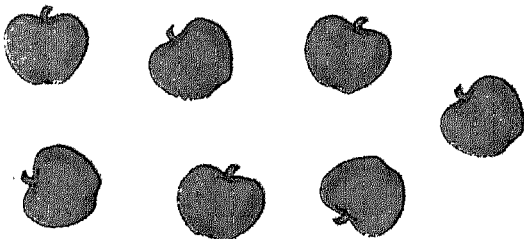
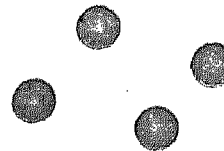
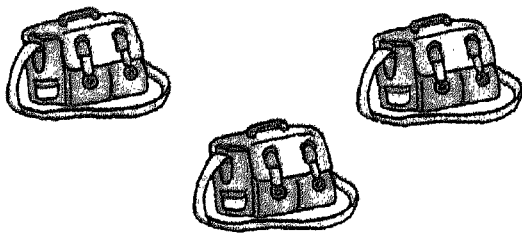
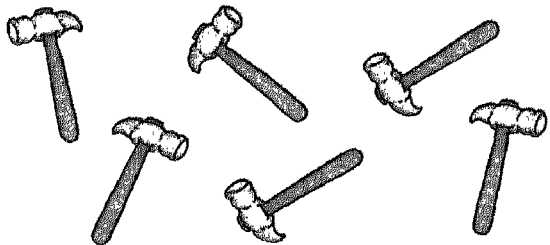
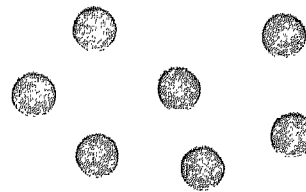
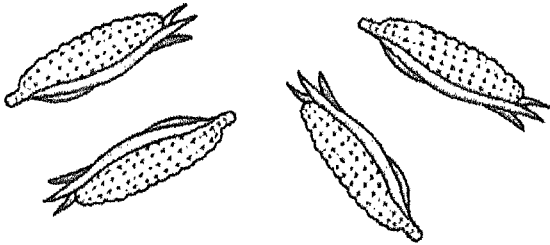
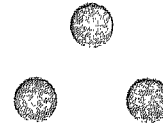
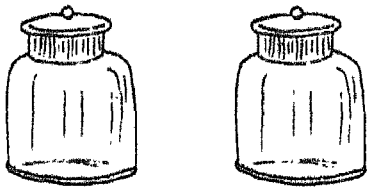
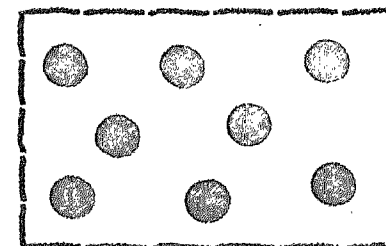
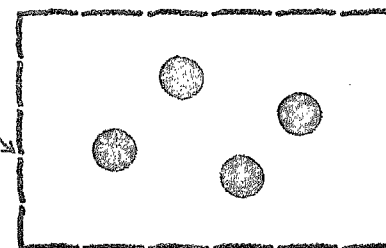
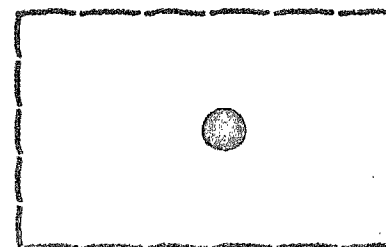
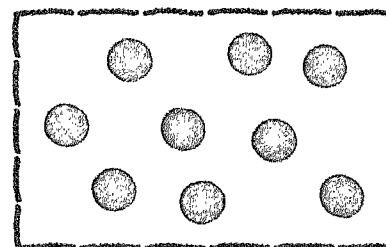
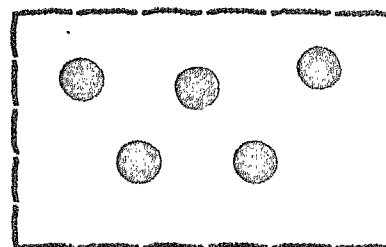
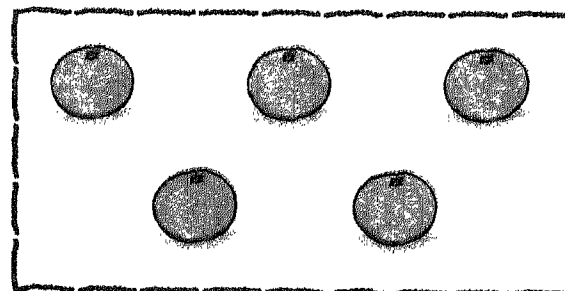
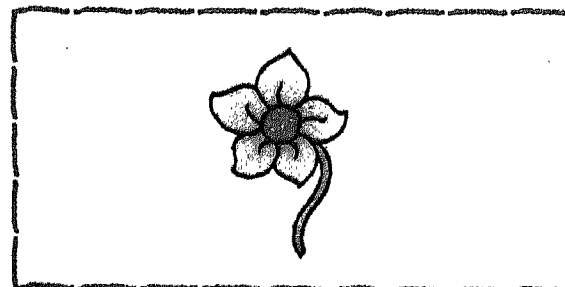
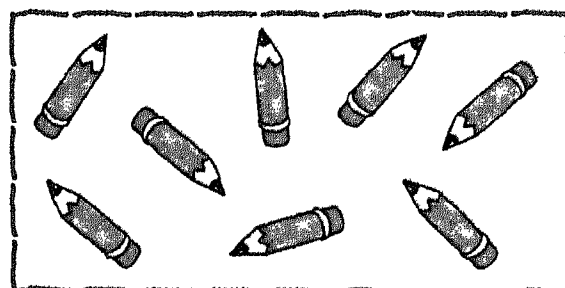
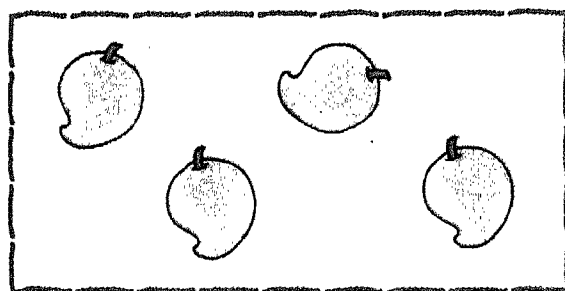
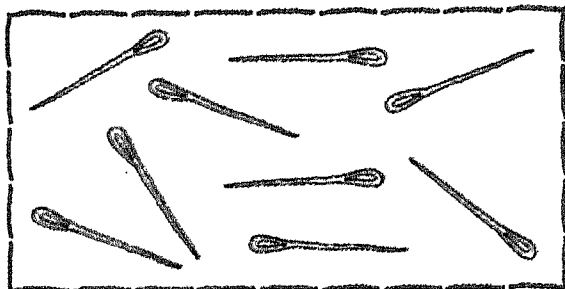
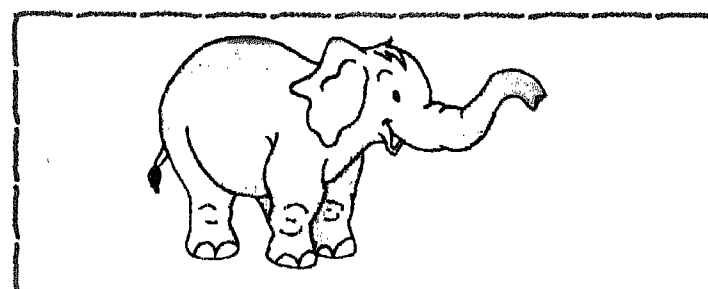
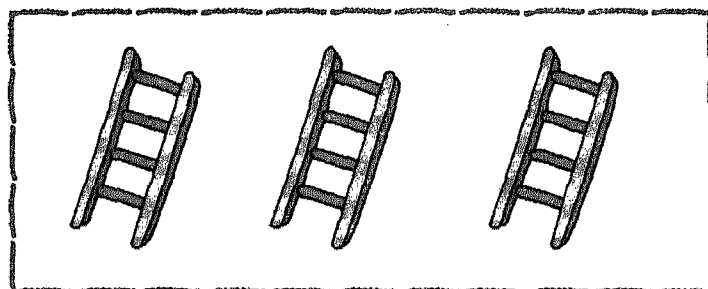
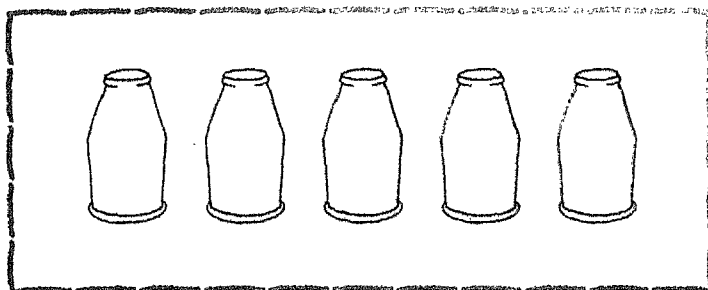
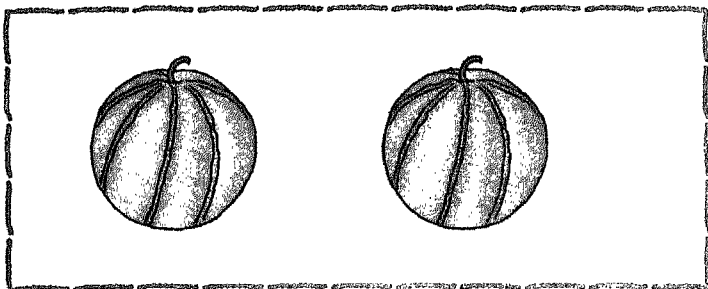
उतने ही जितने कि

गिनना

एक एक एक
छोटा बच्चा एक
खा रहा है सेब।

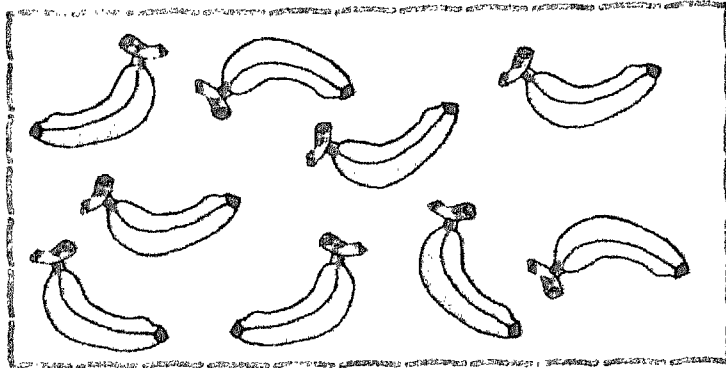
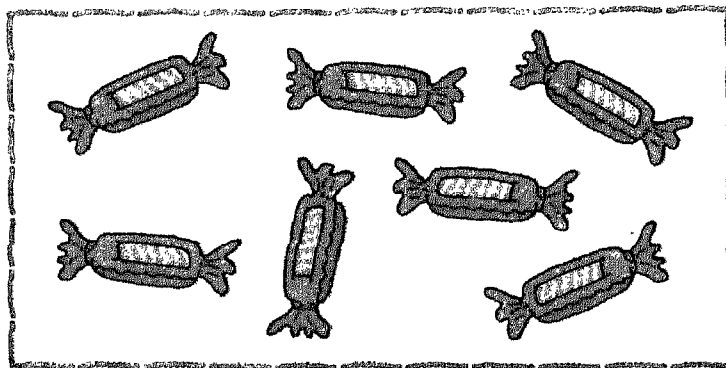
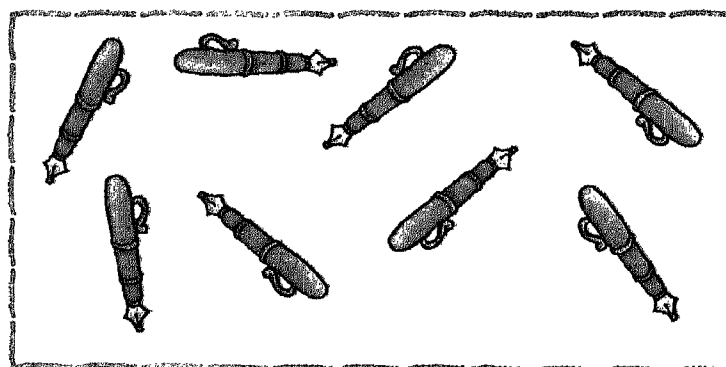
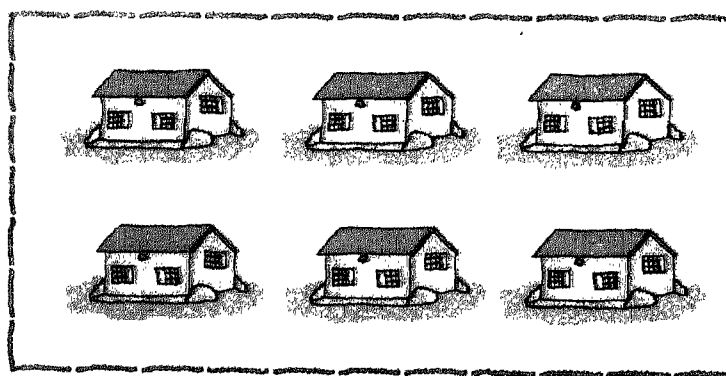
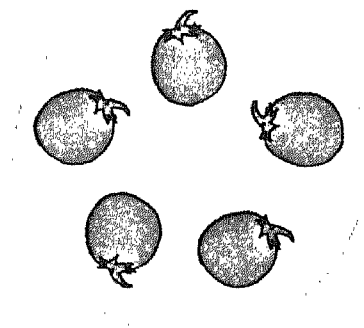
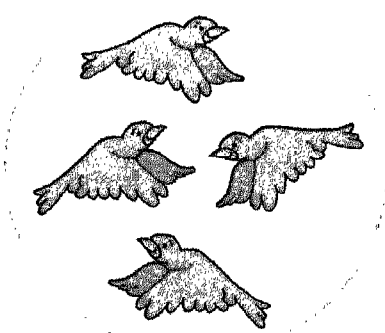
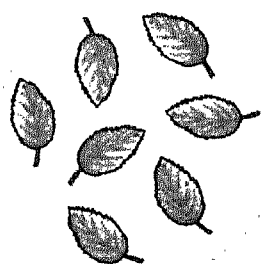
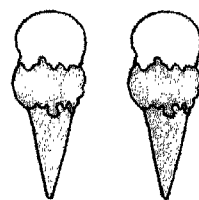
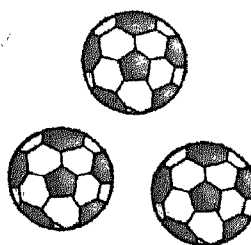
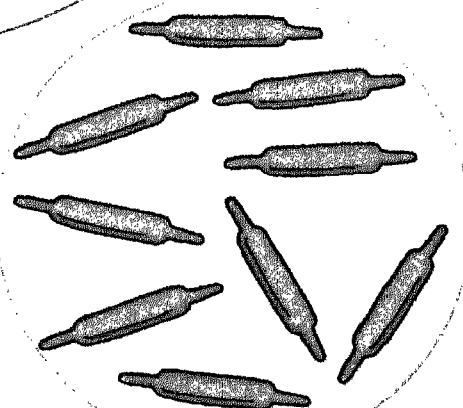
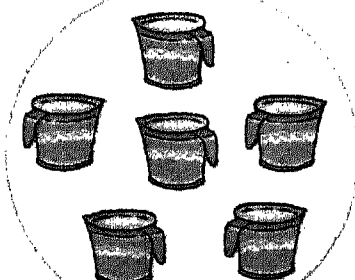
दो दो दो
छोटे बच्चे दो
पहुँचे चिड़ियाघर को।

तीन तीन तीन
नन्हे तोते तीन
उड़कर गए चीन।

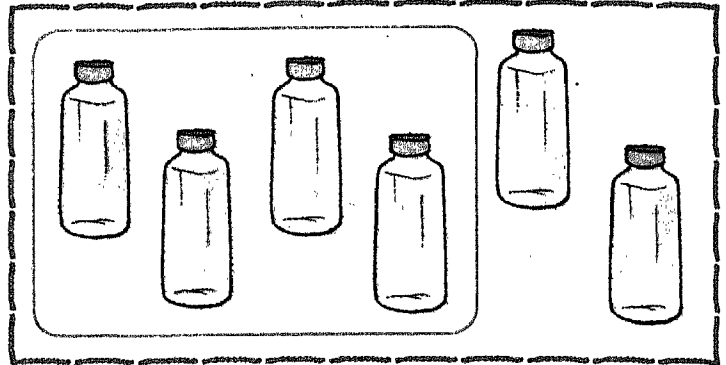
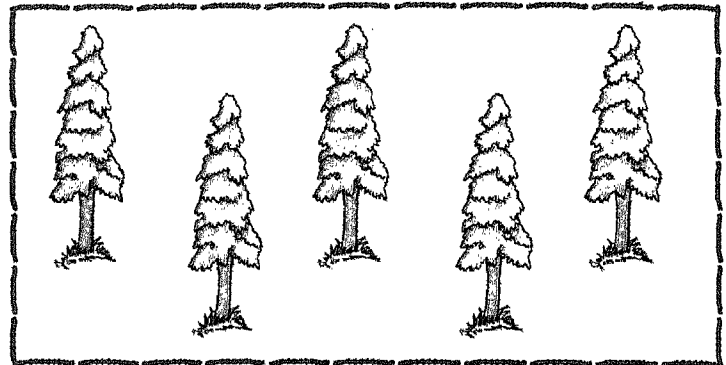
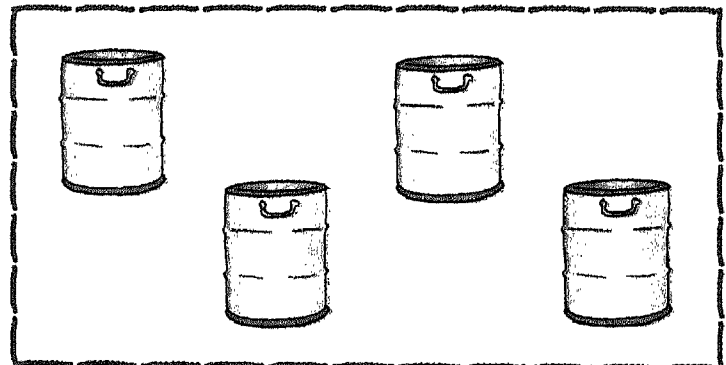
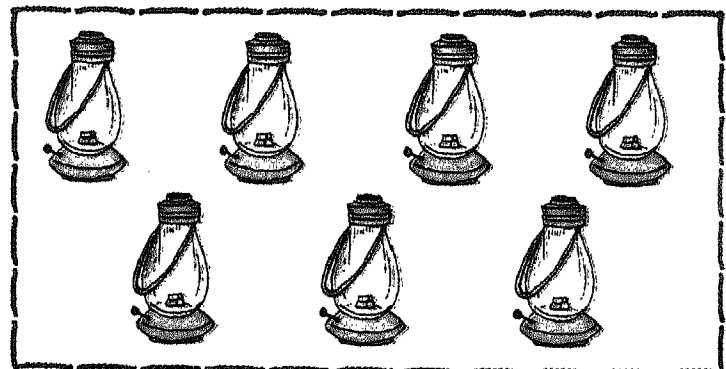
चार चार चार
छोटे पिल्ले चार
खाएँ अपना आहार।

पाँच पाँच पाँच
मधुमक्खियाँ पाँच
छत्ते के पास रही हैं नाच।

छः छः छः
सुनीता के पास कीलें छः
ठोक रही है ठक ठक ठक।

सात सात सात
छोटे बौने सात
जाते साथ-साथ।

आठ आठ आठ
मोटे चूहे आठ
भगाएँ बिल्ली साथ साथ।

नौ नौ नौ
लाल चींटियाँ नौ
खाना रही हैं ढो।

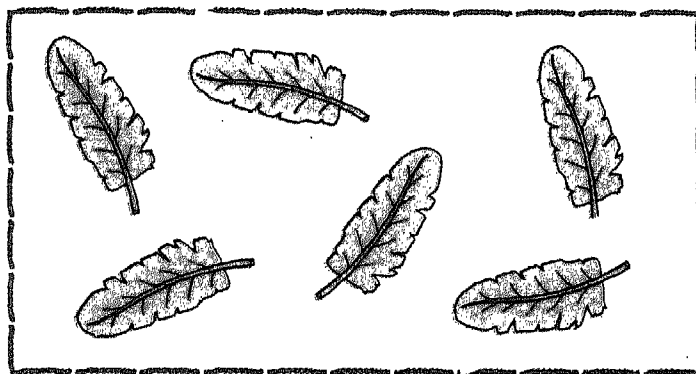
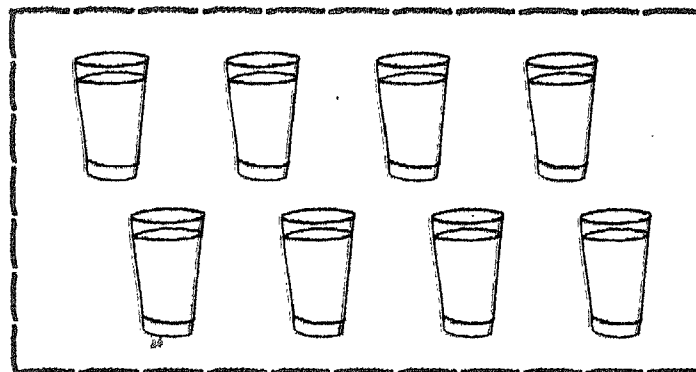
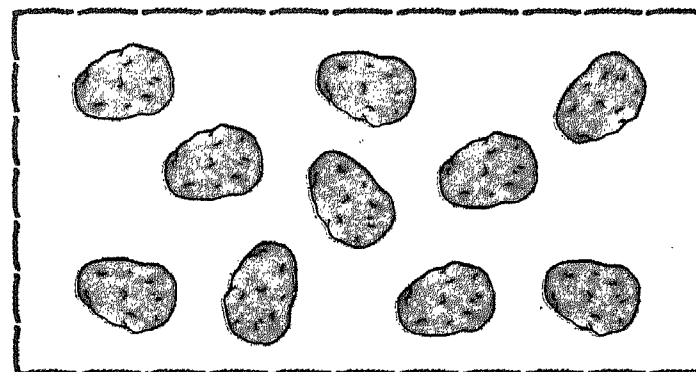
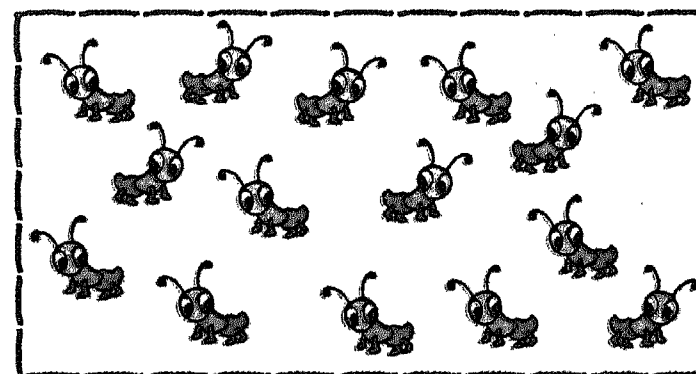
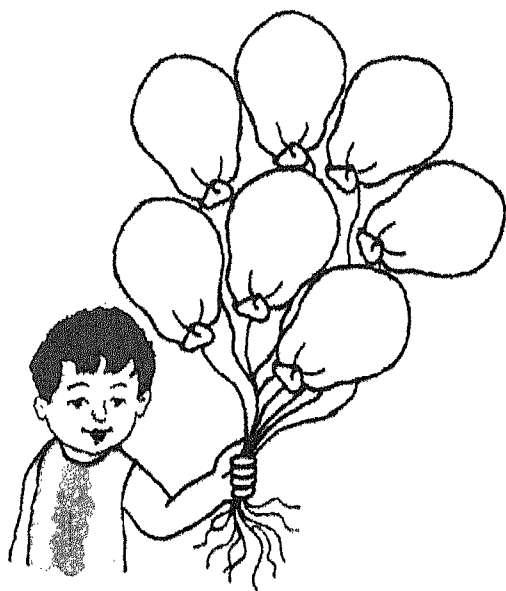
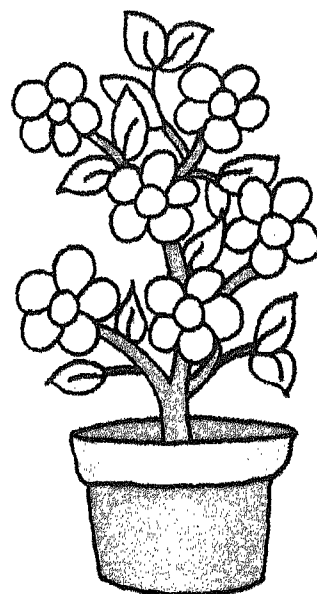
अधिक या कम

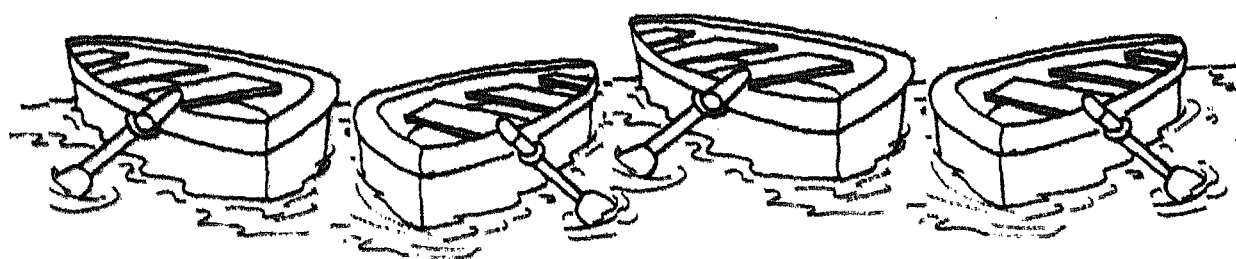
अधिक पर (✓) निशान लगाइए।

अधिक पर (✓) निशान लगाइए।

कम पर (✓) निशान लगाइए।

कम पर (✓) निशान लगाइए।

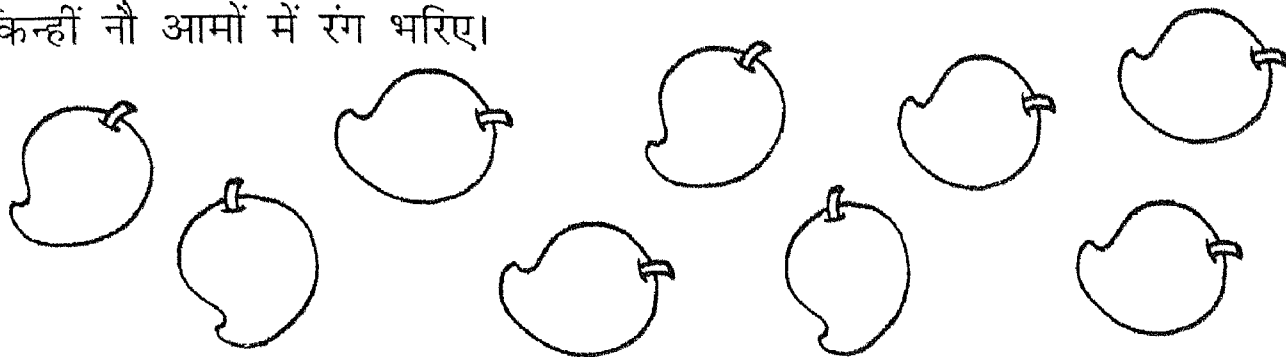
गिनिए और मिलाइए

गिनिए और मिलाइए
26

गिनिए और मिलाइए।

गिनिए और मिलाइए।

संख्याओं को चित्रों के साथ मिलाइए।

समूह बनाइए।

4 बोतल

3 पेड़

2 ड्रम

5 लालटेन

समूह बनाइए।

6 पत्तियाँ

7 गिलास

8 आलू

9 चींटियाँ

किन्हीं पाँच गुब्बारों में रंग भरिए।

किन्हीं चार फूलों में रंग भरिए।

किन्हीं दो पेड़ों में रंग भरिए।

किन्हीं तीन नावों में रंग भरिए।

किन्हीं छः चिड़ियों में रंग भरिए।

किन्हीं नौ आमों में रंग भरिए।

किसी एक हाथी में रंग भरिए।

किन्हीं सात ईंटों में रंग भरिए।

एक
एक
34

दो

2

दो

2

2

2

2

तीन
3
तीन
3
36

चार

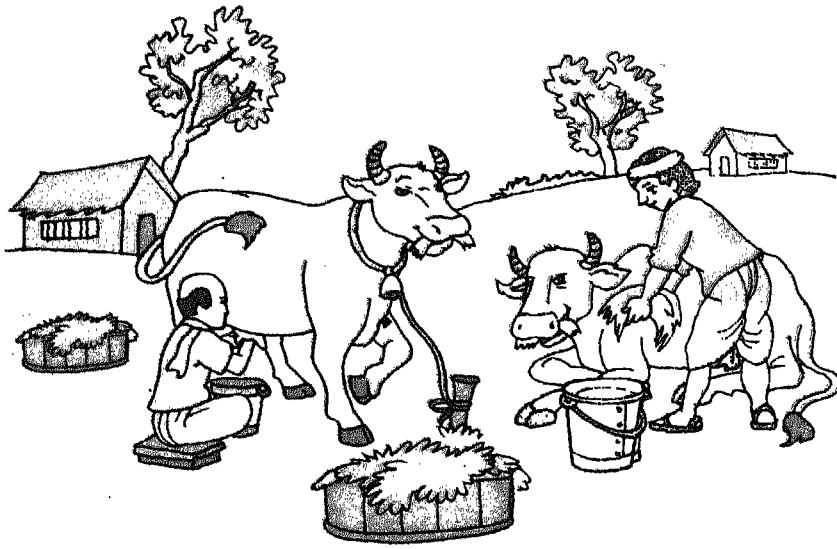
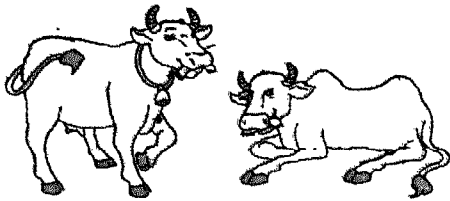
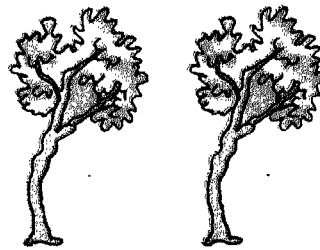
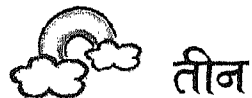
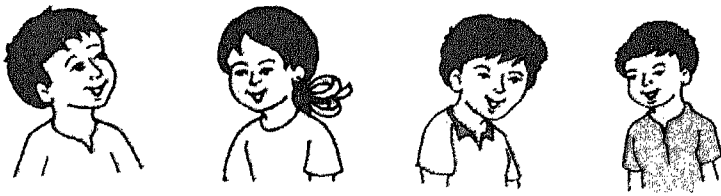
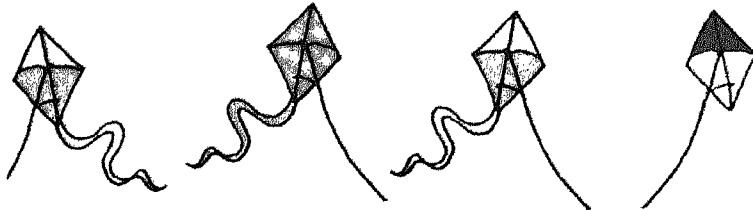
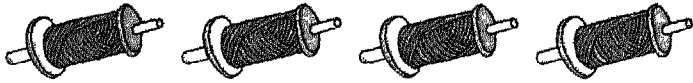
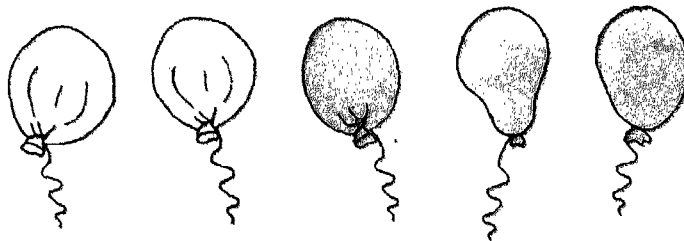
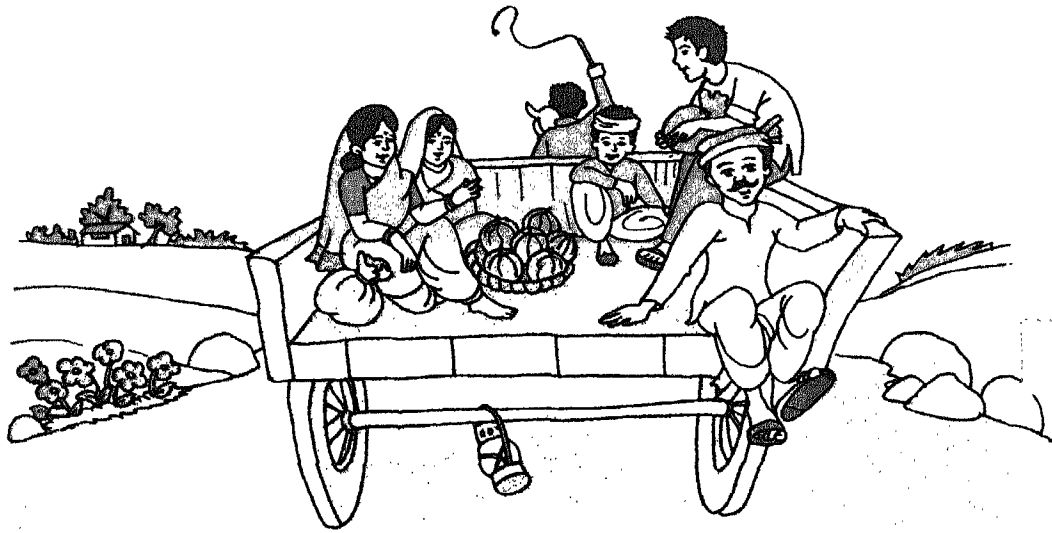
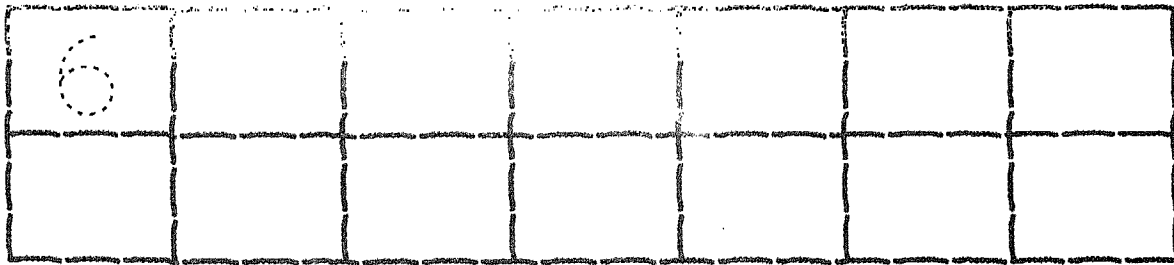
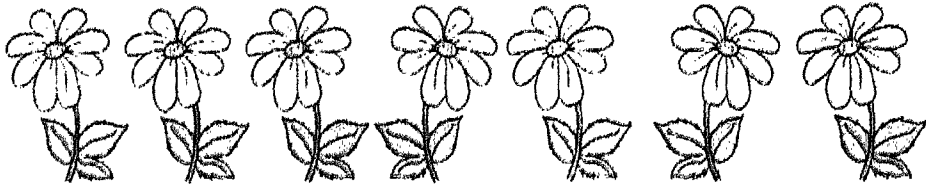
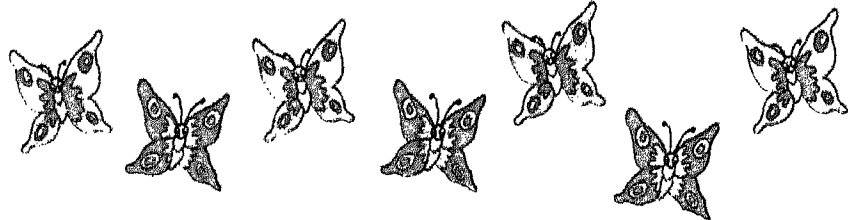
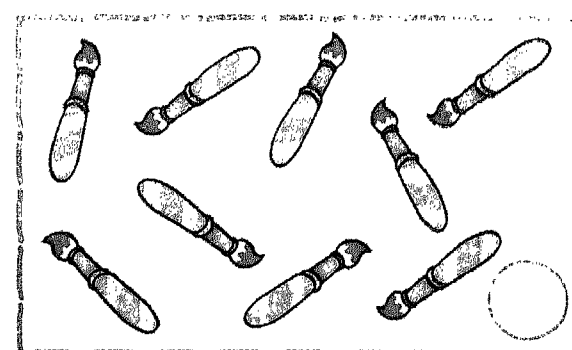
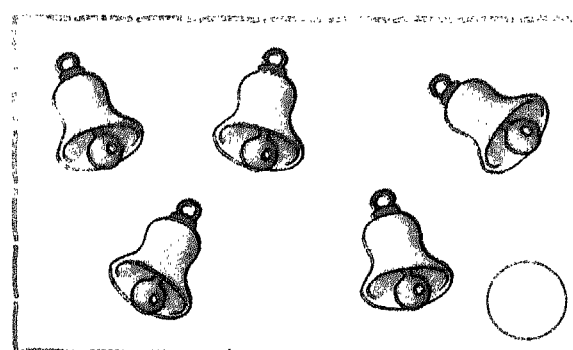
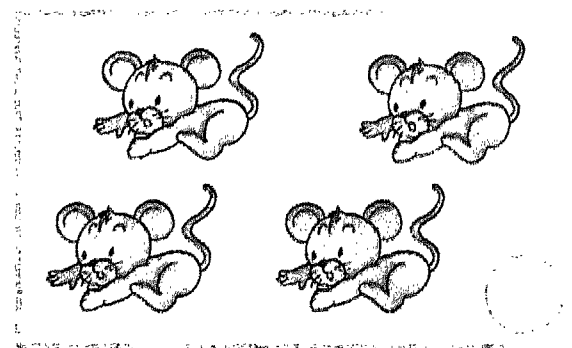
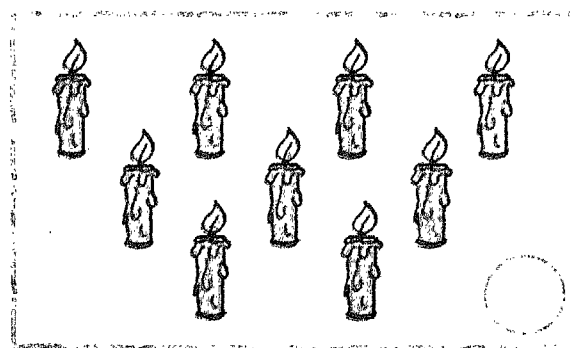
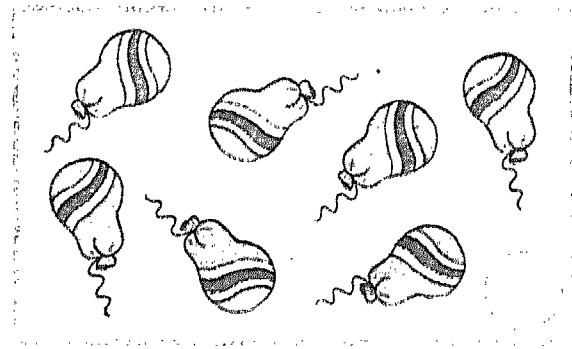
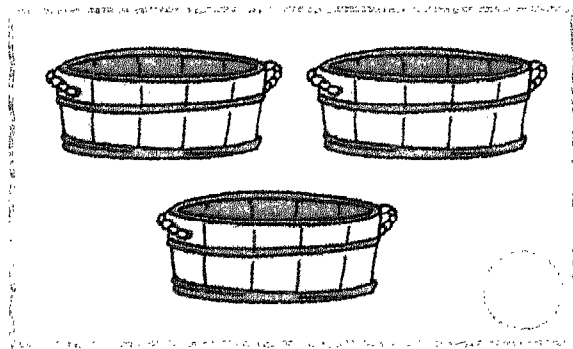
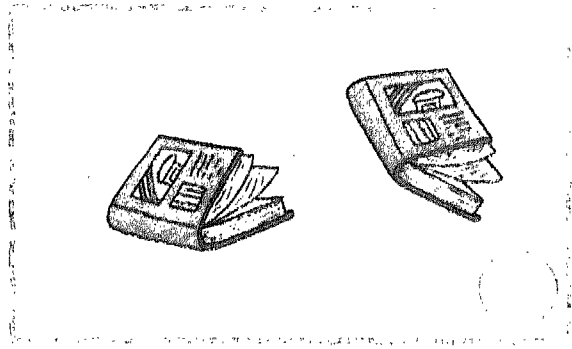
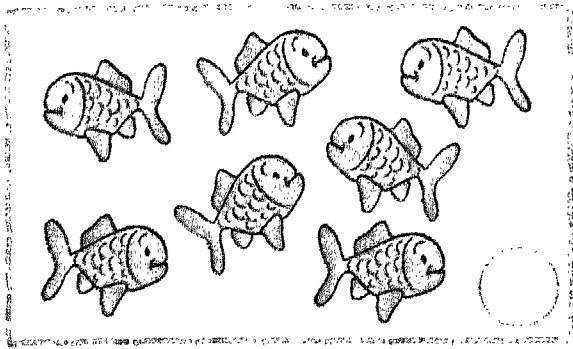
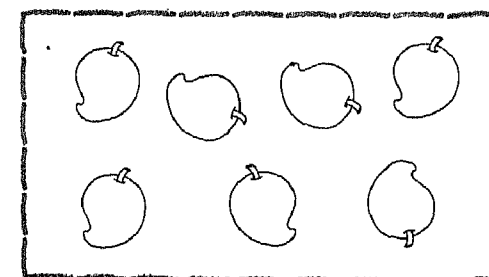
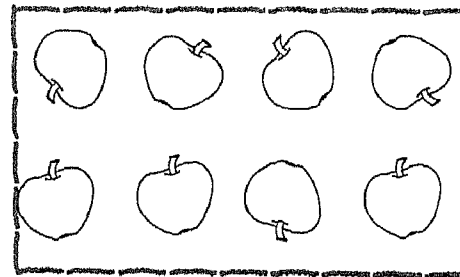
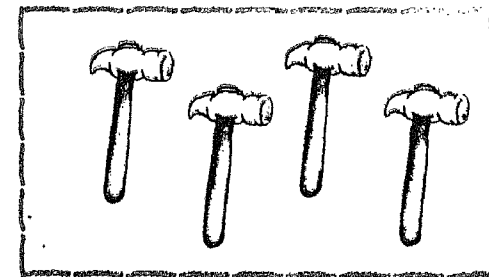
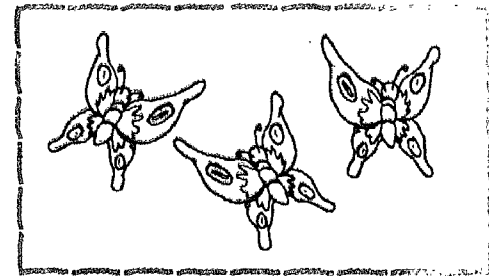
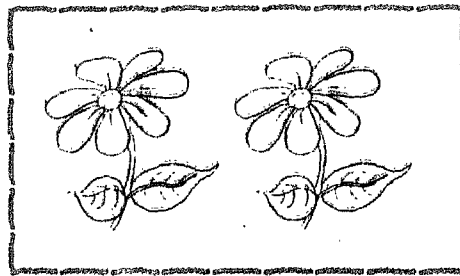
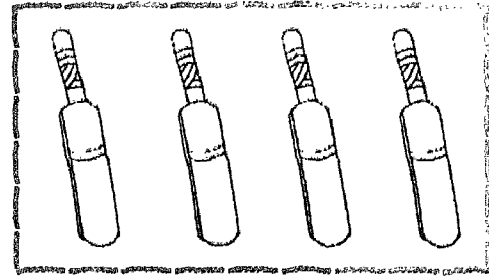
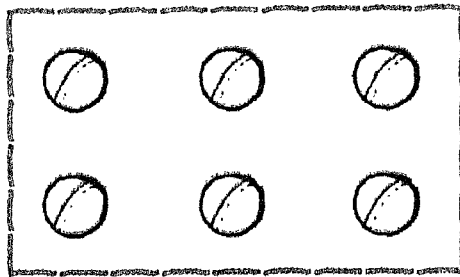
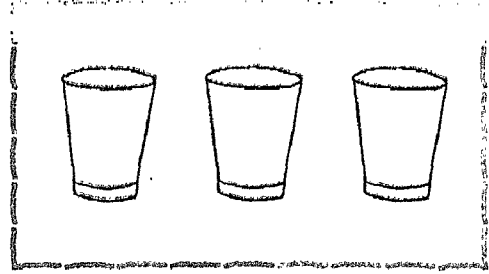
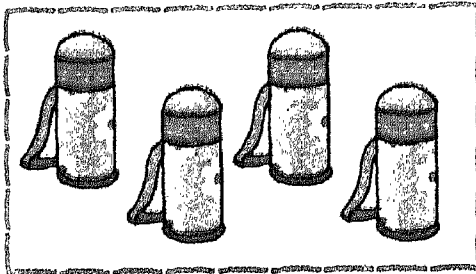
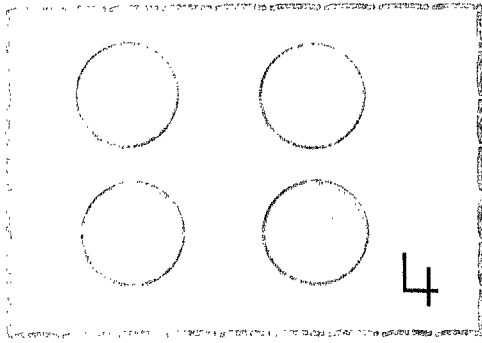
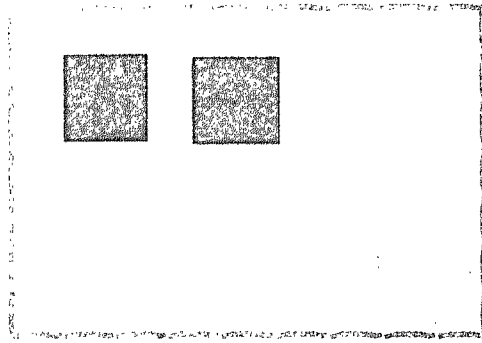
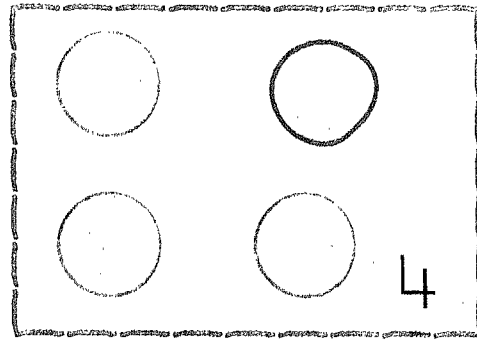
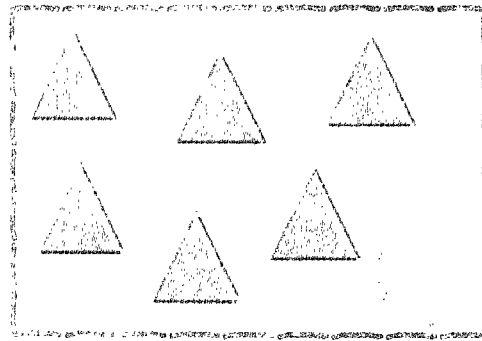
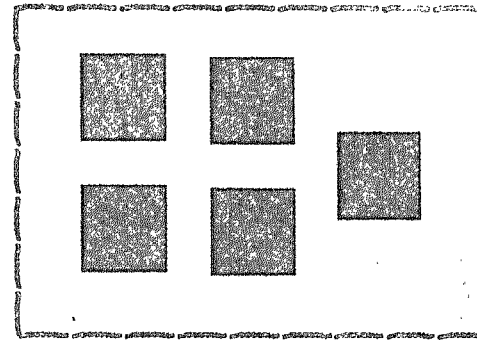
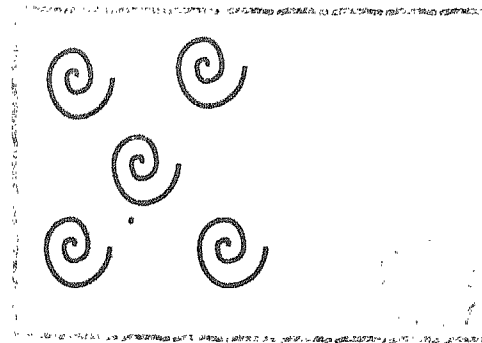
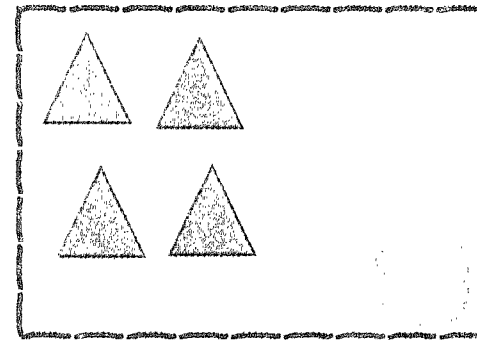
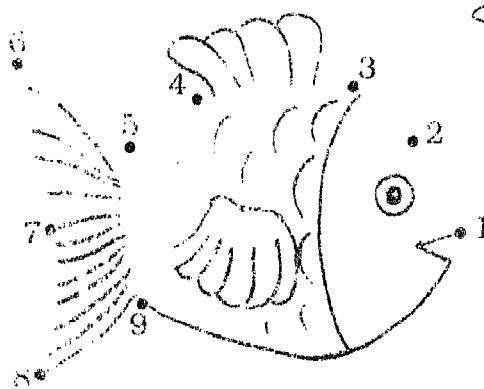
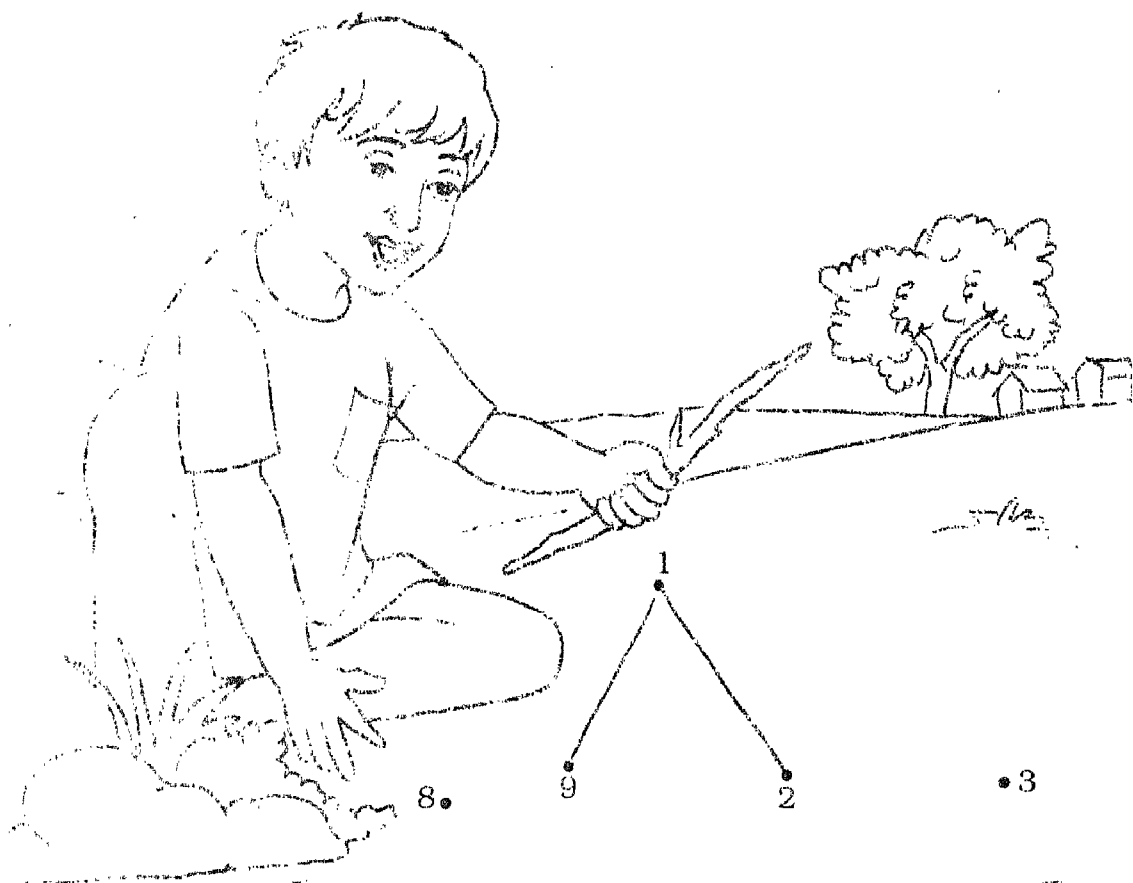
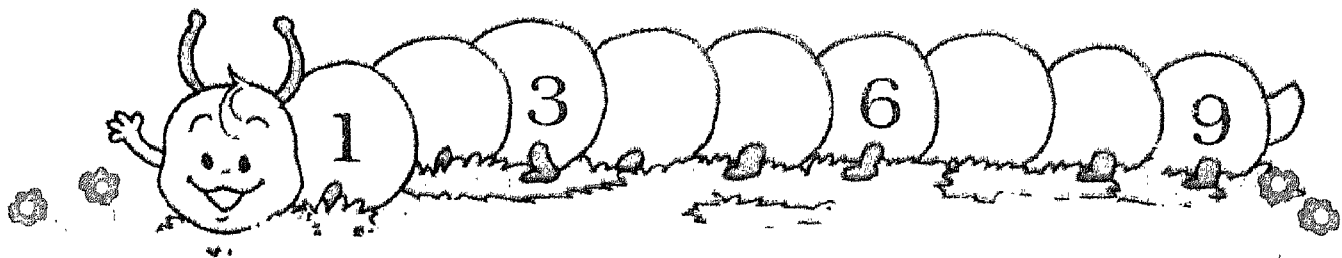
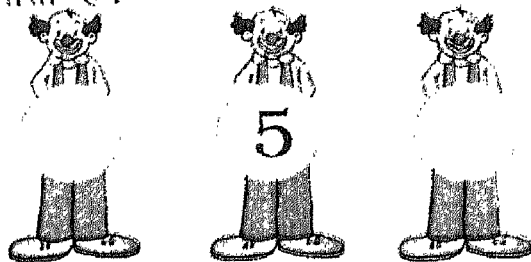
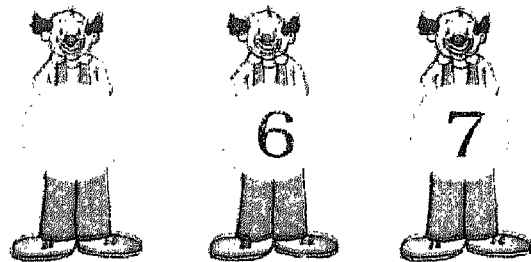
चार

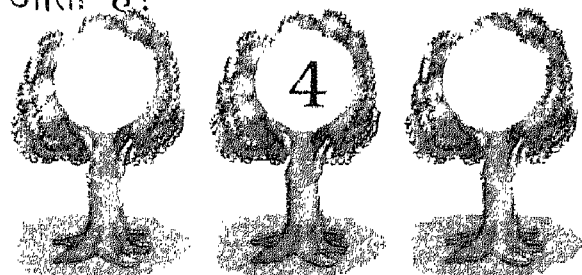
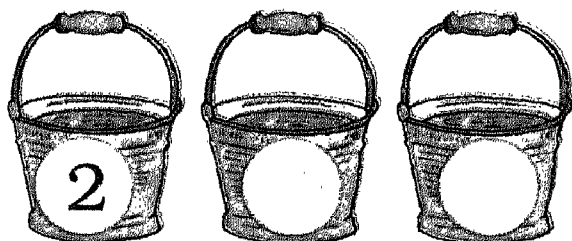
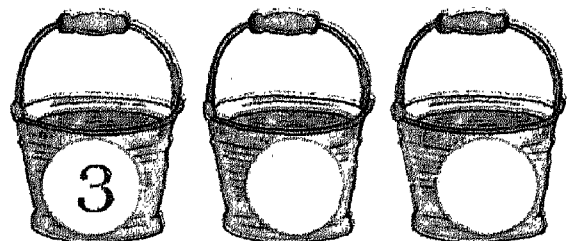
पाँच
5
पाँच
5
5
5
5
38

छः
6
छः
6
39

सात

आठ
आठ

नौ
९
नौ
42
९

वस्तुओं के नाम बताइए और उनकी संख्याएँ गोले में लिखिए

अधिक वस्तुओं वाले समूह में रंग भरिए।

समूहों को बराबर बनाइए।

छूटी हुई संख्याएँ लिखिए।

5 से पहले और बाद में क्या आता है?

6 से पहले क्या आता है?

1 के बाद क्या आता है?

4 से पहले और बाद में क्या आता है?

अगली संख्याएँ क्या हैं?

अगली संख्याएँ क्या हैं?

शून्य

पाँच रसीले आम
टोकरी में रखे थे
माला ने खाया एक
कितने बच गए शेष?

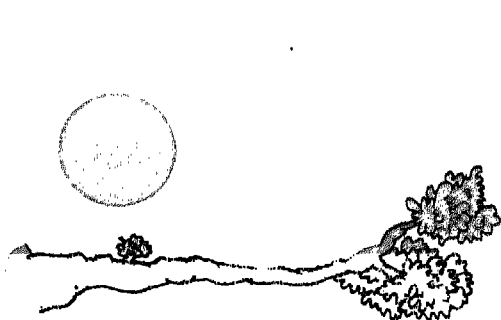
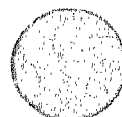
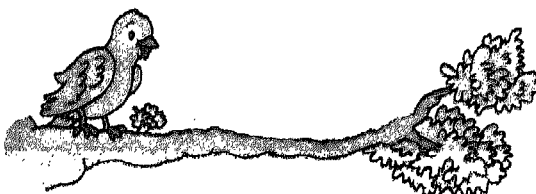
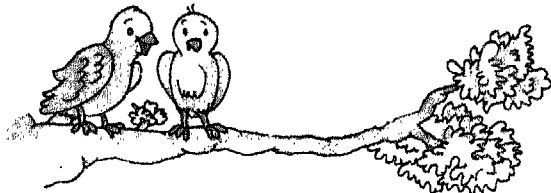
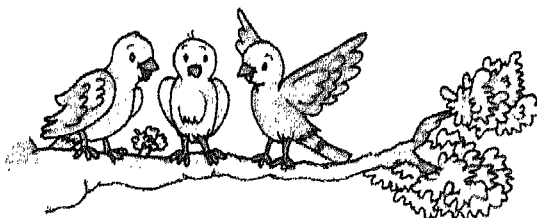
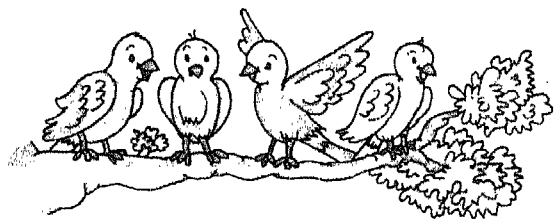
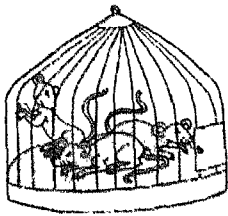
चार रसीले आम
टोकरी में रखे थे
माला ने खाया एक
कितने बच गए शेष?

तीन रसीले आम
टोकरी में रखे थे
माला ने खाया एक
कितने बच गए शेष?

दो रसीले आम
टोकरी में रखे थे
माला ने खाया एक
कितने बच गए शेष?

एक रसीला आम
टोकरी में रखा था
माला ने खाया एक
कितना बच गया शेष?

शून्य

पेड़ की शाखा पर बैठी हुई चिड़ियों को गिनिए और उनकी संख्या लिखिए।

पिंजरे में कितने चूहे हैं?

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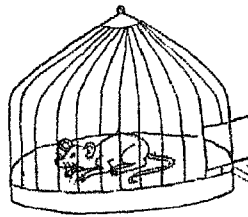
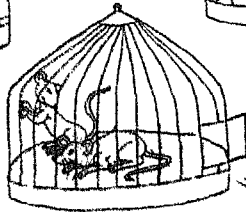
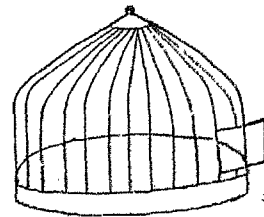
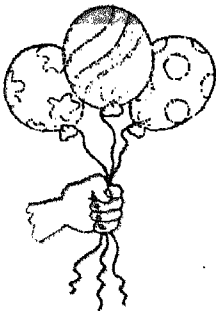
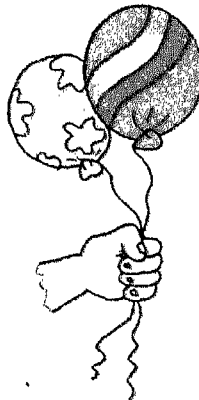
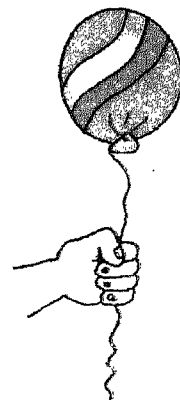
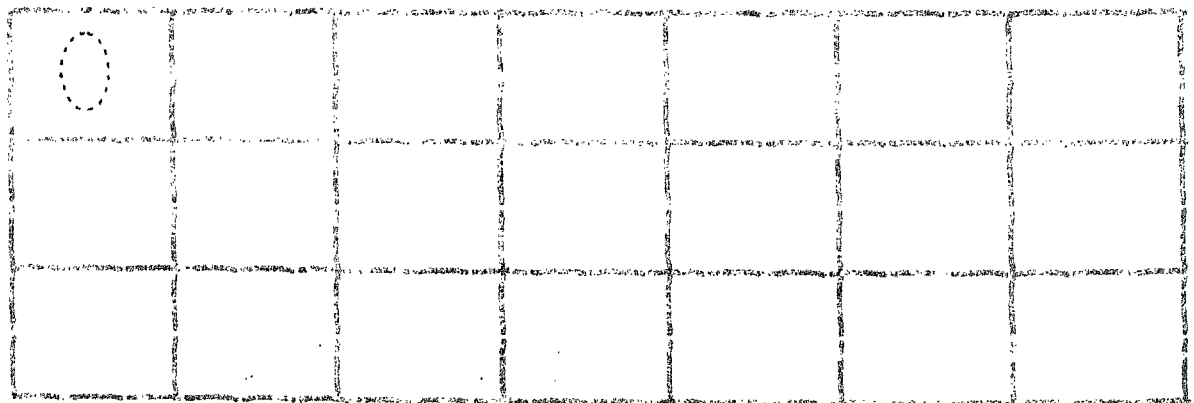
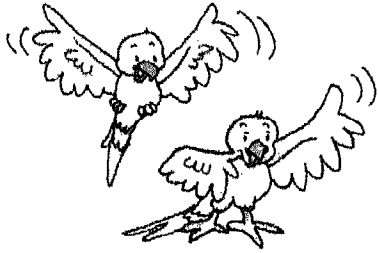

चूहे

चूहा

चूहे

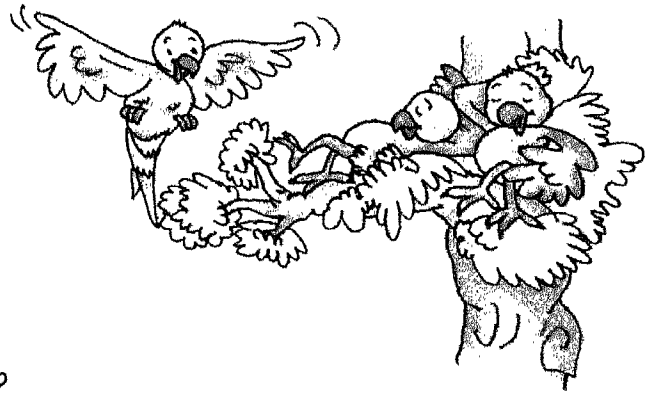
हाथ में कितने गुब्बारे हैं?

3 गुब्बारे

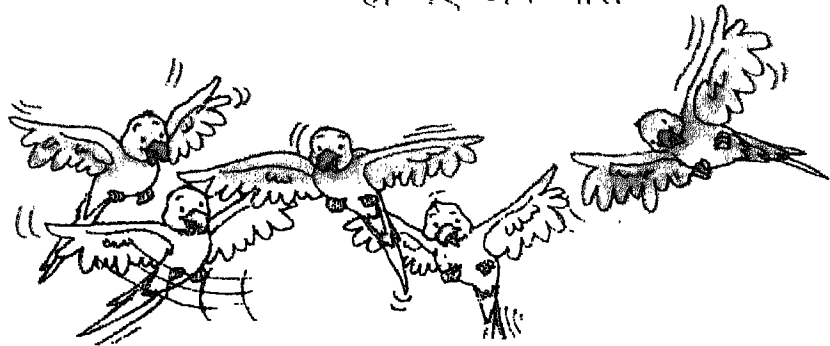
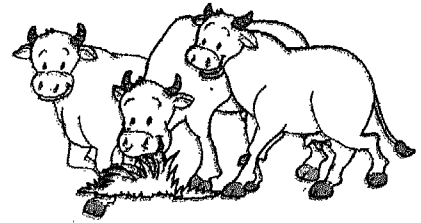
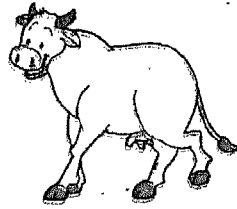
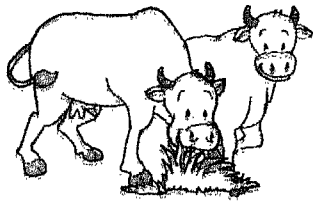
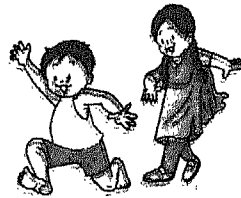
गुब्बारे

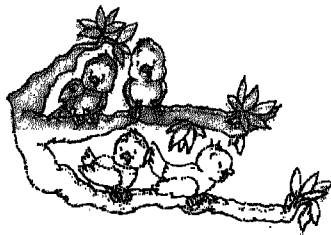
गुब्बारा

गुब्बारे

जोड़

एक अधिक

एक हरा तोता,
नाच रहा था वो,
एक और आ गया,
हो गए अब दो।

दो छोटे तोते,
दाना रहे थे बीन,
एक और आ गया,
हो गए अब तीन।

तीन छोटे तोते,
उड़ने को तैयार,
एक और आ गया,
हो गए अब चार।

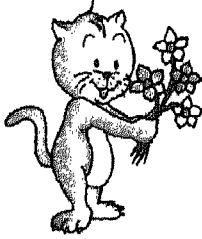
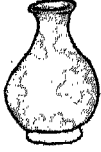
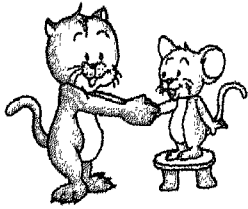
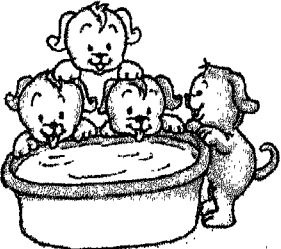
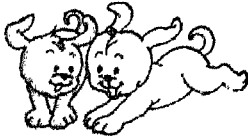
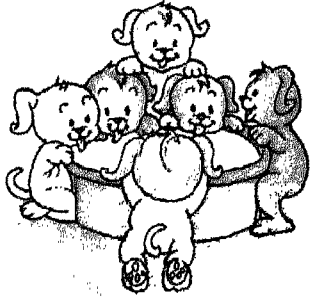
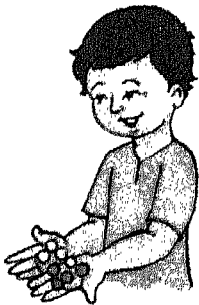
चार छोटे तोते,
दिखा रहे थे नाच,
एक और आ गया,
हो गए अब पाँच।

कुल मिलाकर कितने?

2 गायें और 1 गाय होती हैं 3 गायें

3 बच्चे और 2 बच्चे होते हैं 5 बच्चे

☐ फूल और ☐ फूल ☐ फूल

☐ चिड़ियाँ और ☐ चिड़ियाँ ☐ चिड़ियाँ

कुल मिलाकर कितने?

6 और 2 = 8

और =

और =

और =

कुल मिलाकर कितने?

4 + 3 = 7

☐ + ☐ = ☐

☐ + ☐ = ☐

जोड़

2 + 3 = 5

$$\begin{array}{r} 2 \\ +\ 3 \\ \hline 5 \end{array}$$

4 + 2 =

$$\begin{array}{r} 4 \\ +\ 2 \\ \hline \end{array}$$

5 + 1 =

$$\begin{array}{r} 5 \\ +\ 1 \\ \hline \end{array}$$

3 + 6 =

$$\begin{array}{r} 3 \\ +\ 6 \\ \hline \end{array}$$

7 + 0 =

$$\begin{array}{r} 7 \\ +\ 0 \\ \hline \end{array}$$

0 + 9 =

$$\begin{array}{r} 0 \\ +\ 9 \\ \hline \end{array}$$

जोड़

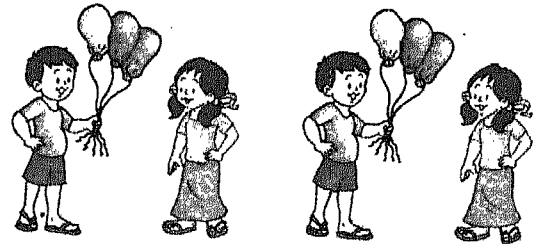
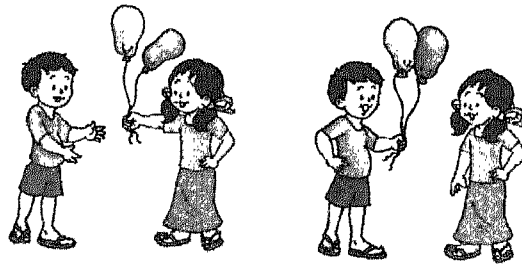
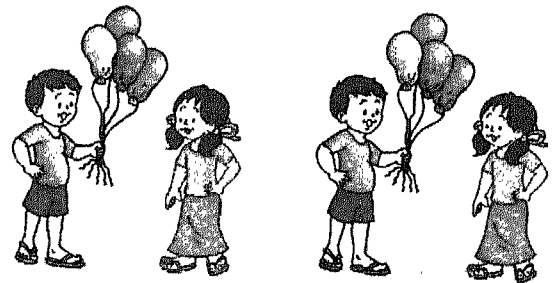
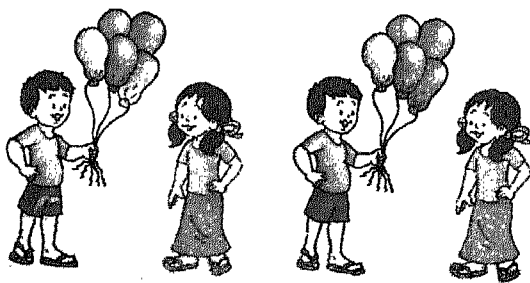
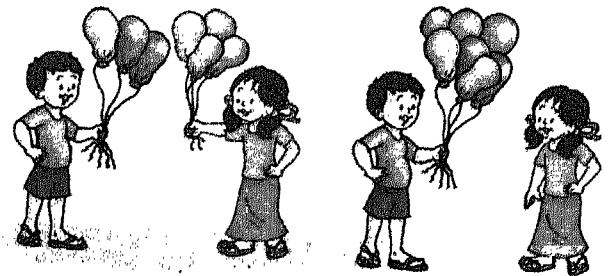
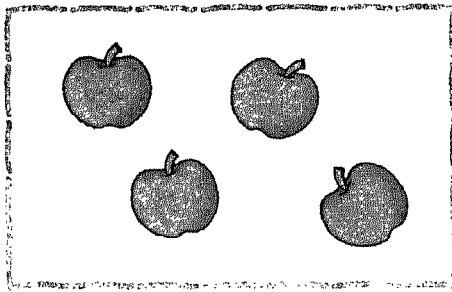
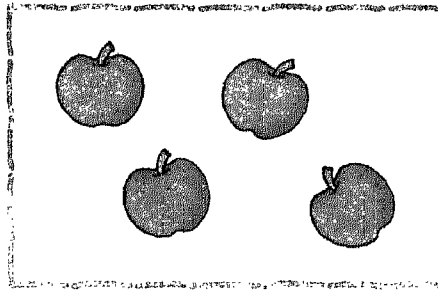
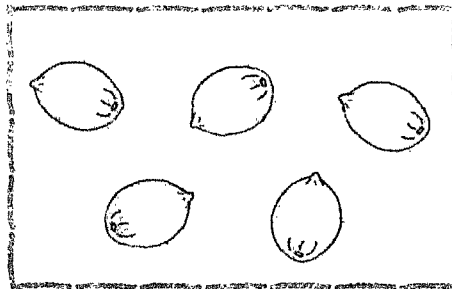
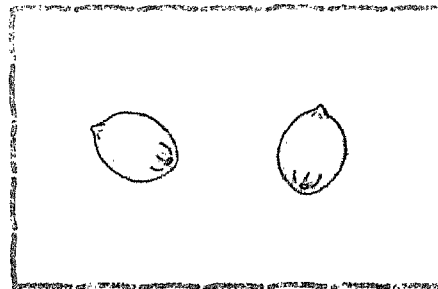
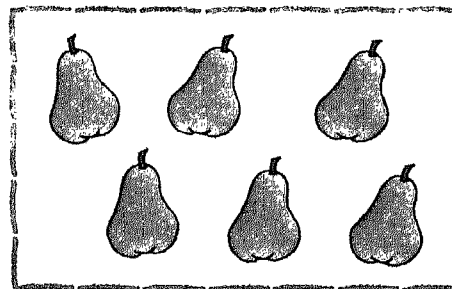
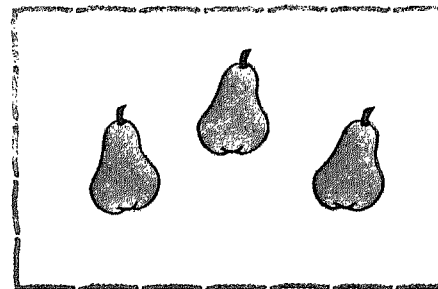
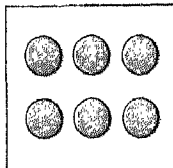
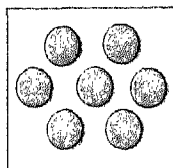
3 + 2 = 5 गुब्बारे

3 + 0 = 3 गुब्बारे

0 + 2 = ☐

4 + 0 = ☐

5 + 0 = ☐

3 + 4 = ☐

जोड़
3 + 4 = 7
+ =
+ =
+ =
57

जोड़िए और मिलाइए

3 + 2		3 + 3
4 + 2		2 + 3
3 + 4		0 + 8
8 + 0		3 + 6
6 + 3		5 + 2
2 + 1		1 + 2
1 + 3		3 + 1

जोड़िए

2 + 7 = ☐

3 + 5 = ☐

4 + 0 = ☐

2 + 2 = ☐

1 + 3 = ☐

4 + 1 = ☐

0 + 2 = ☐

3 + 4 = ☐

3	5	3
+ 6	+ 2	+ 3

0	6	1
+ 8	+ 3	+ 7

2	5	3
+ 3	+ 0	+ 4

छूटी हुई संख्याओं को लिखिए

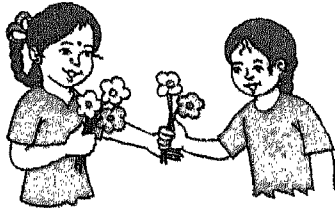
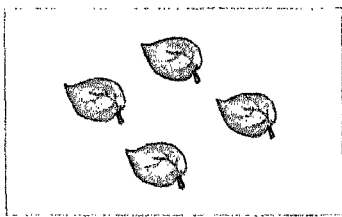
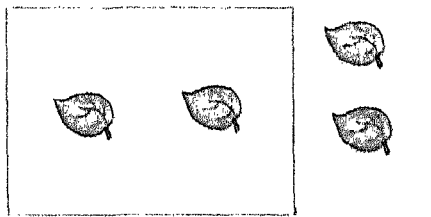
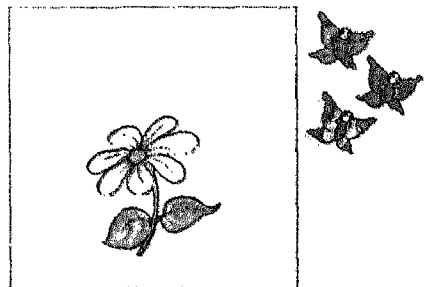
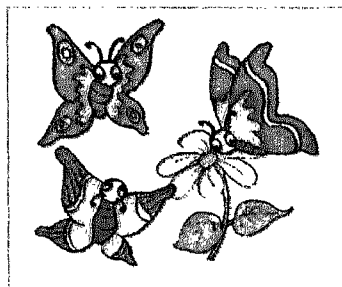
$\square + \square = 5$ $\quad$ $\square + \square = 6$

$\square + \square = 7$ $\quad$ $\square + \square = 3$

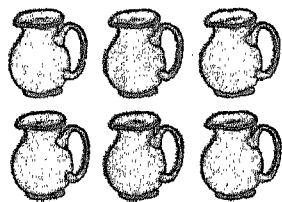
$\square + \square = 4$ $\quad$ $\square + \square = 9$

$\square + \square = 8$ $\quad$ $\square + \square = 1$

घटाव

इनमें से निकालें तो

5 निकालें 2 तो बचे 3

4 निकालें 2 तो बचे ☐

☐ निकालें ☐ तो बचे ☐

☐ निकालें ☐ तो बचे ☐

घटाव

6	–	4	=	2

5	–	2	=	

9	–	4	=	

5	–	1	=	

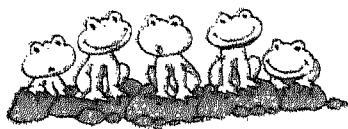
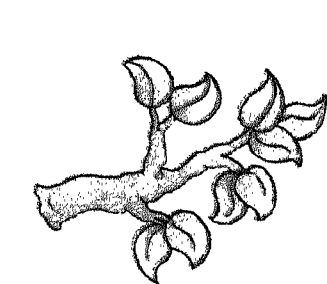
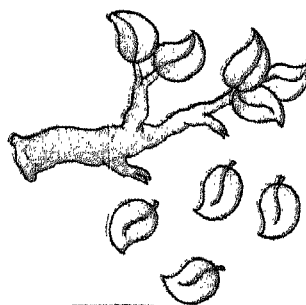
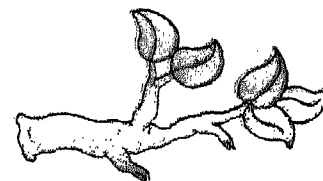
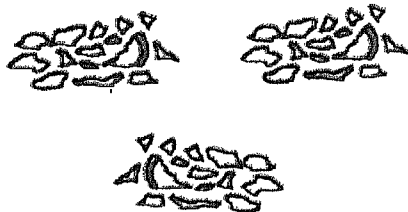
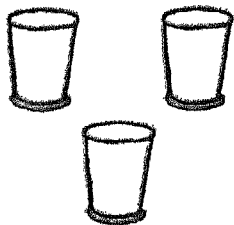
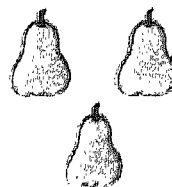
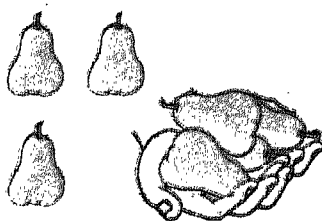
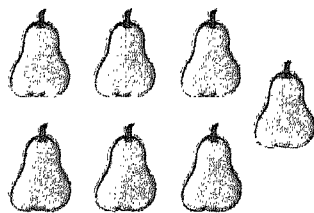
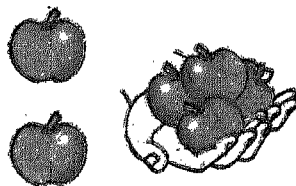
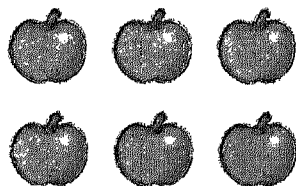
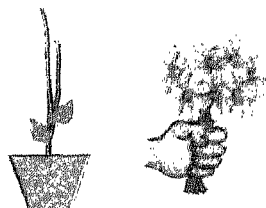
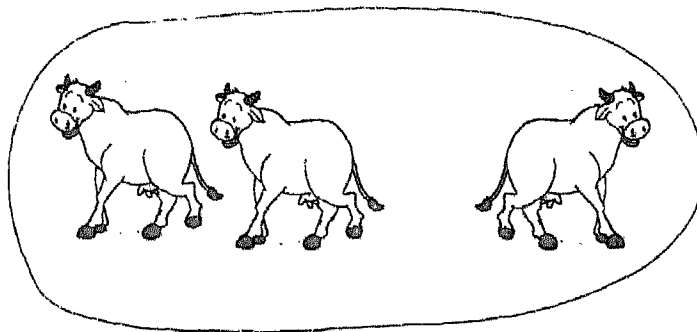
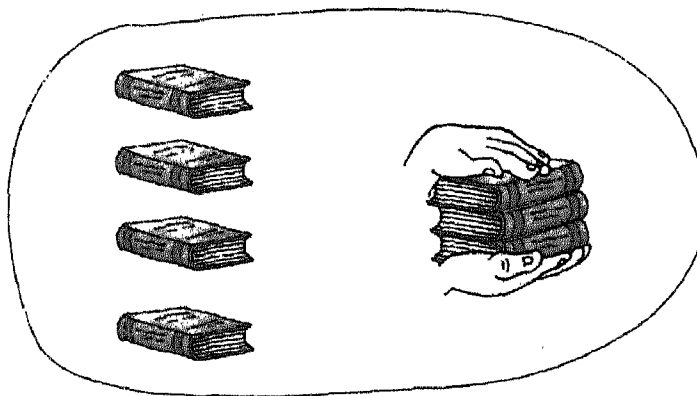
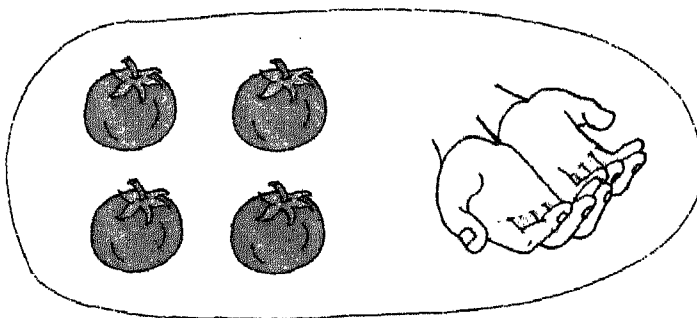
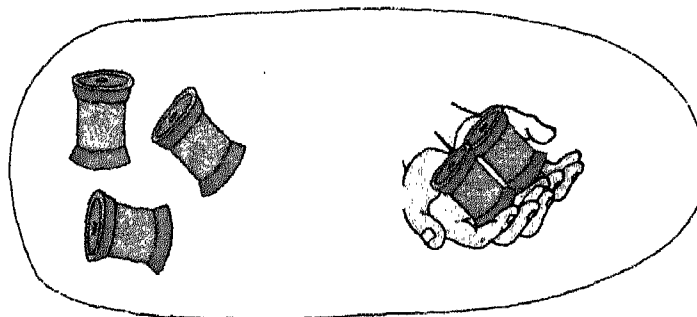
घटाव

घटाव

3 − 1 = 2

□ − □ = □

□ − □ = □

□ − □ = □

घटाव

5 − 4 = 1

$$\begin{array}{r} 5 \\ -\ 4 \\ \hline 1 \end{array}$$

6 − 2 = ☐

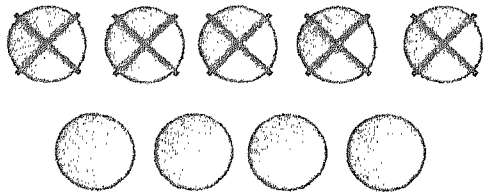
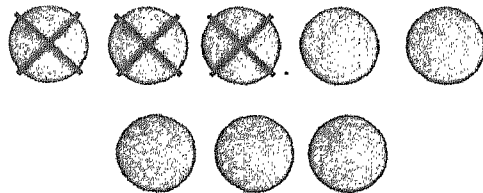
$$\begin{array}{r} 6 \\ -\ 2 \\ \hline \end{array}$$

9 − 5 = ☐

$$\begin{array}{r} 9 \\ -\ 5 \\ \hline \end{array}$$

4 − 4 = ☐

$$\begin{array}{r} 4 \\ -\ 4 \\ \hline \end{array}$$

8 − 3 = ☐

$$\begin{array}{r} 8 \\ -\ 3 \\ \hline \end{array}$$

घटाइए और मिलाइए

4 – 2	3	9 – 5
7 – 2	4	8 – 2
9 – 1	2	7 – 4
5 – 1	5	8 – 0
6 – 3	6	5 – 3
7 – 1	8	8 – 3
5 – 0	0	7 – 7

घटाइए

$4 - 2 = 2$

$4 - 0 =$ ☐

$5 - 2 =$ ☐

$6 - 5 =$ ☐

$7 - 7 =$ ☐

$8 - 4 =$ ☐

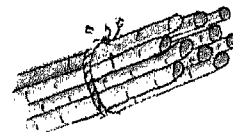
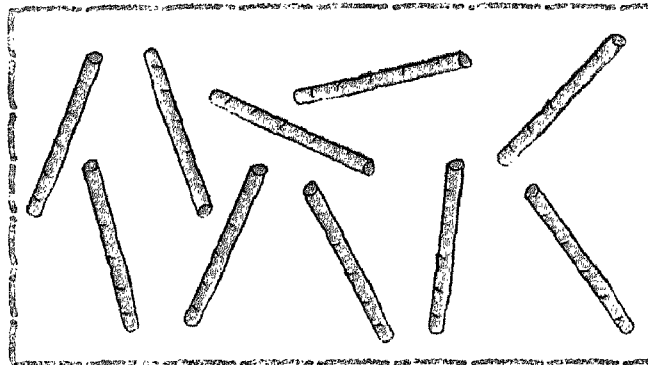
$3 - 1 =$ ☐

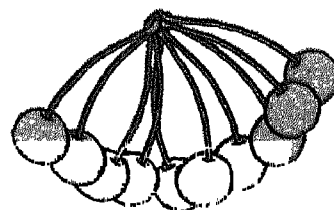
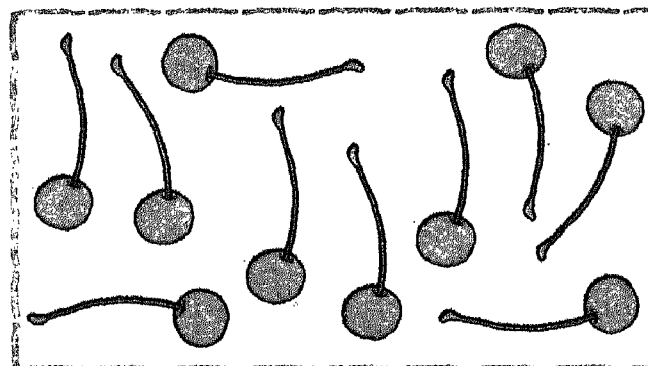
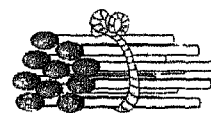
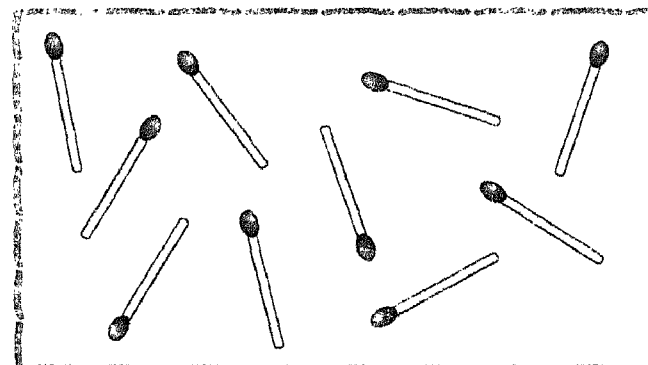
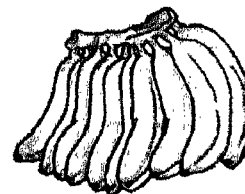
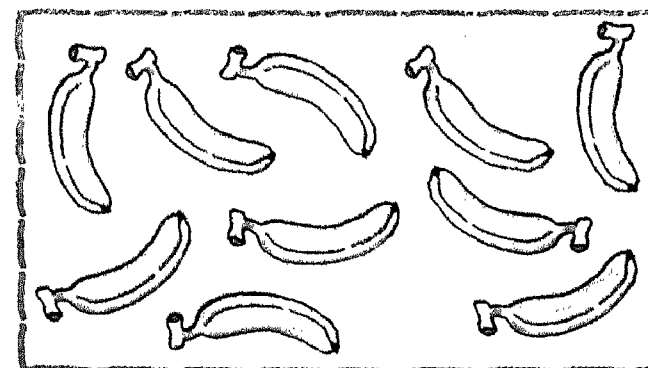
$$\begin{array}{r} 2 \\ -\ 0 \\ \hline 2 \end{array} \qquad \begin{array}{r} 9 \\ -\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 3 \\ -\ 0 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ -\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ -\ 2 \\ \hline \end{array}$$

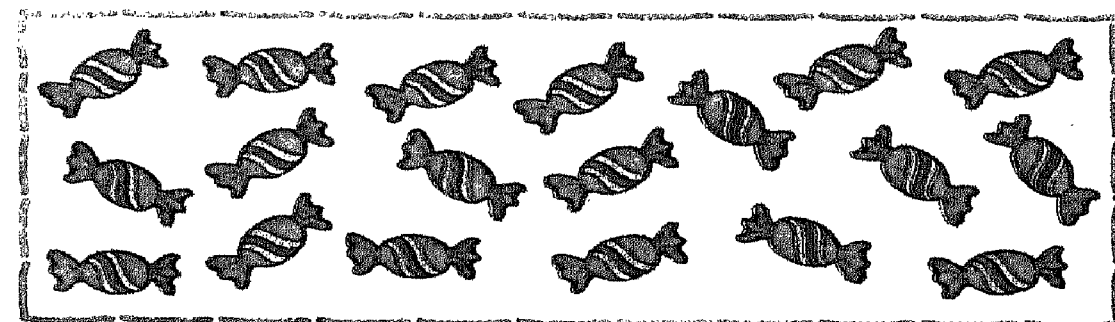
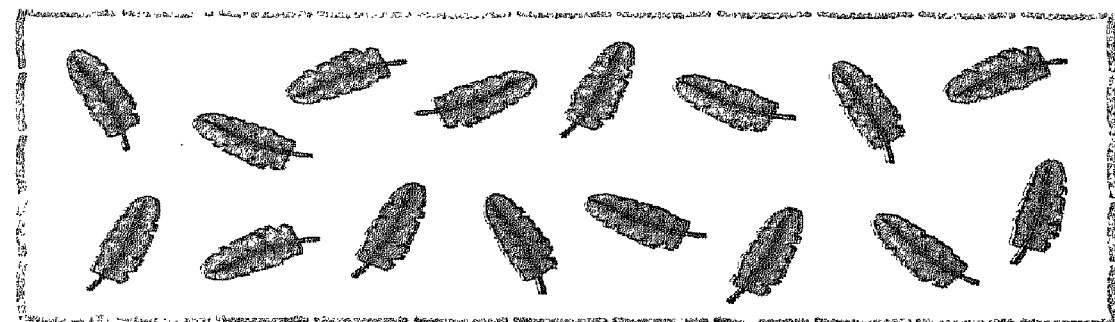
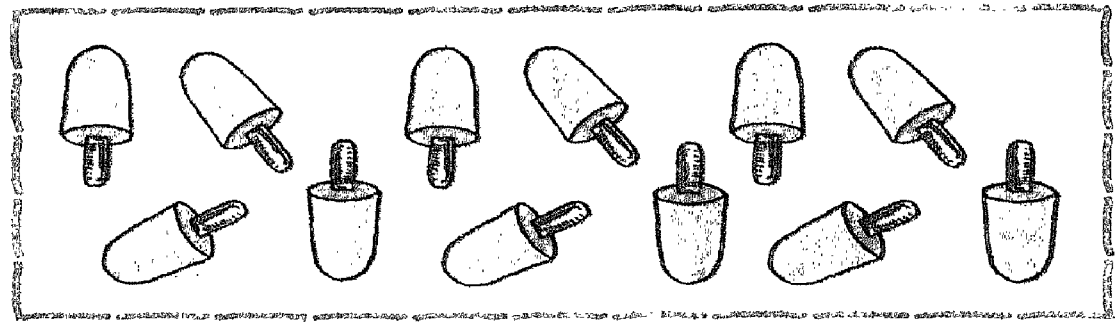
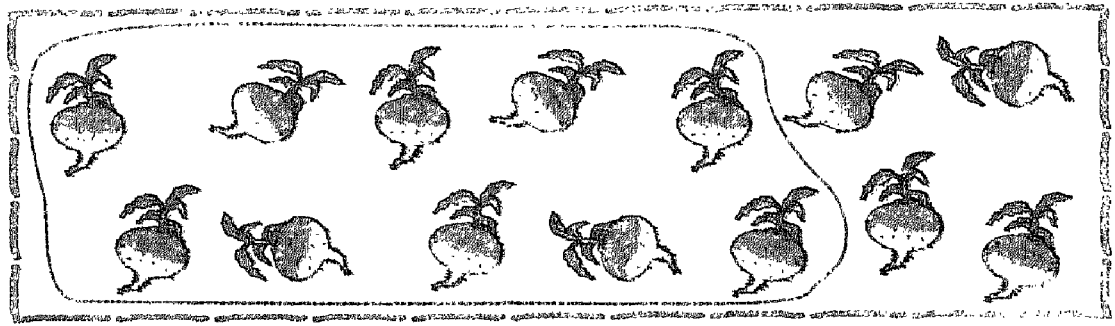
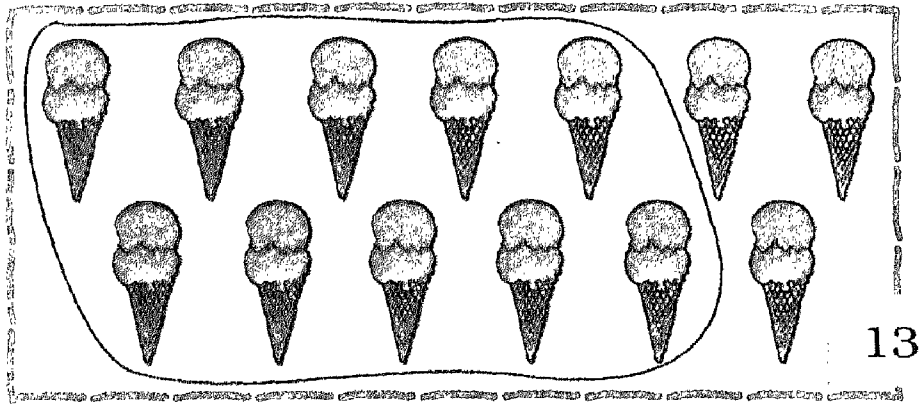
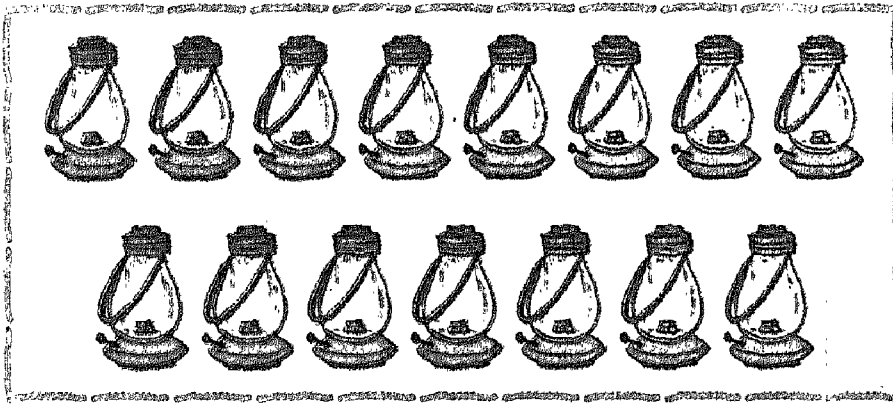
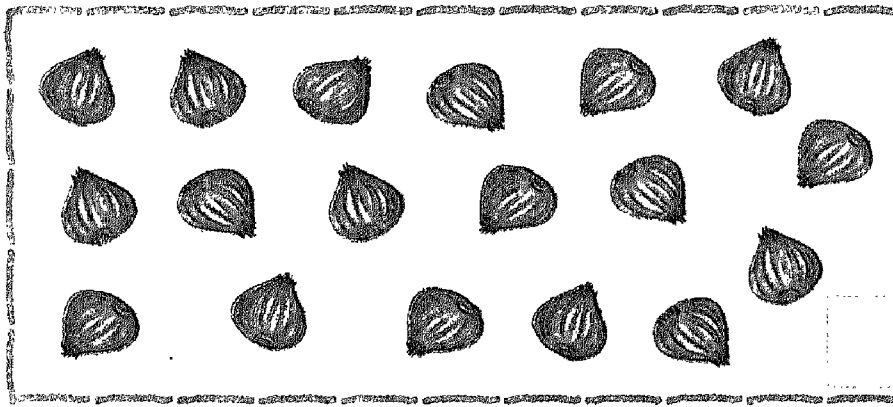
छूटी हुई संख्याएँ लिखिए

8	−		=	7
5	−		=	1
3	−		=	3
9	−	2	=	

	−	2	=	3
	−	3	=	5
	−	2	=	0
	−	2	=	7

दस से बीस तक की संख्याएँ

दस का एक बंडल

दस का एक बंडल

दस का एक बंडल

दस का एक बंडल

10 का समूह बनाइए।

10 का समूह बनाइए और संख्याएँ लिखिए।

दहाई	इकाइयाँ
1	3

दहाई	इकाइयाँ

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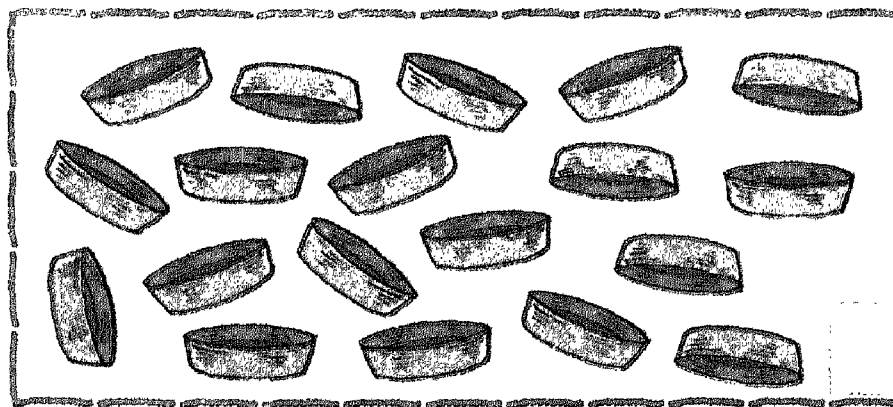
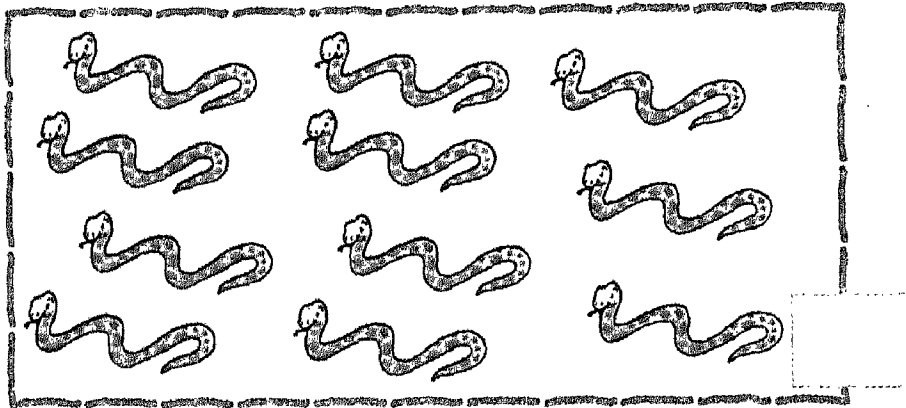

दहाई	इकाइयाँ

10 का समूह बनाइए।

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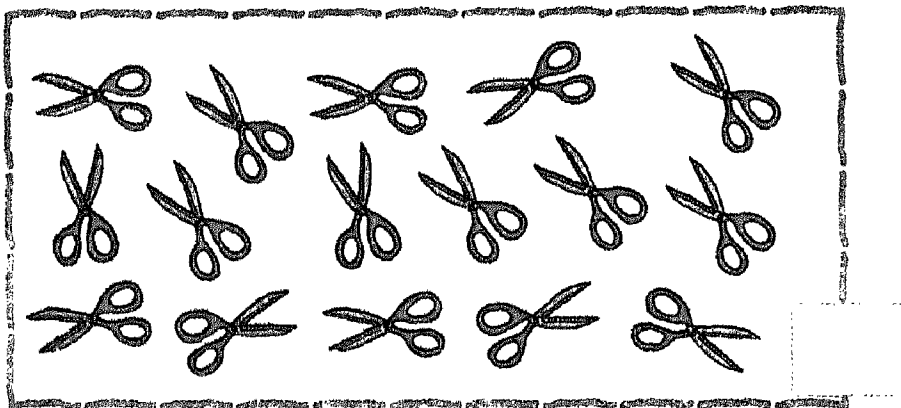
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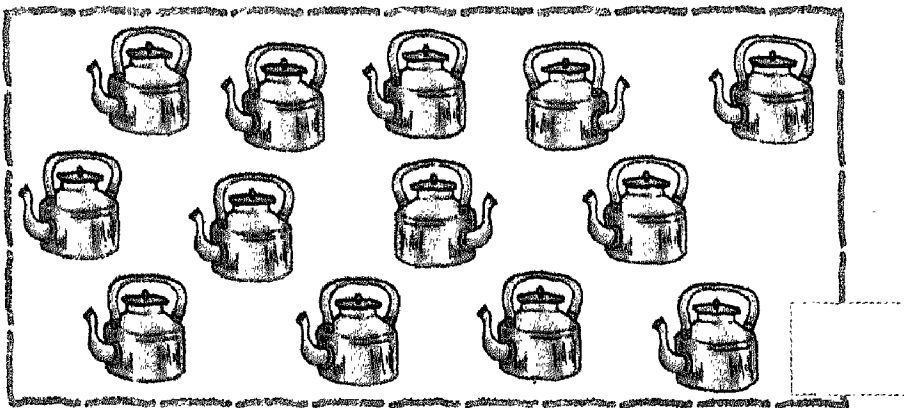
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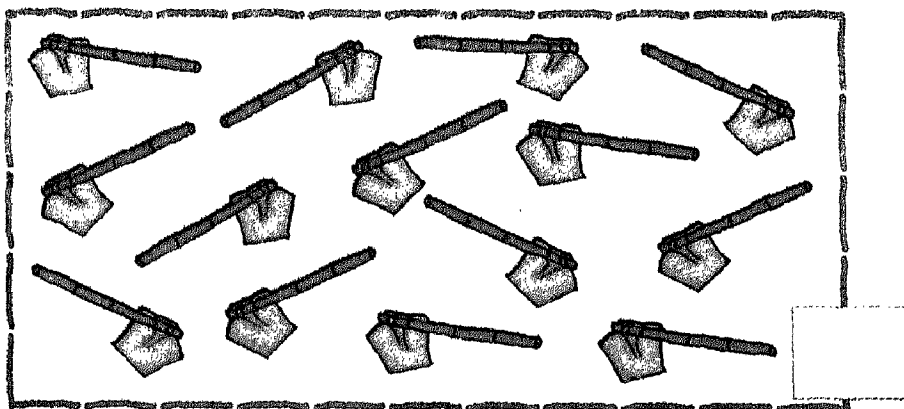
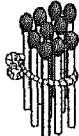
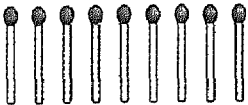
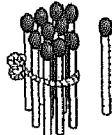
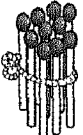
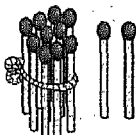
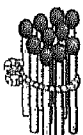
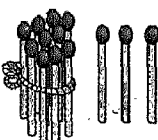
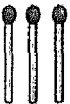
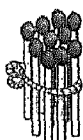
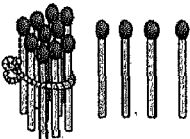
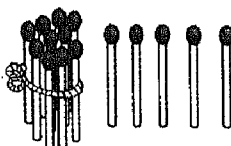
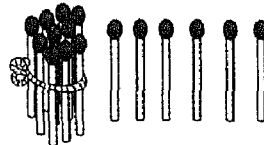
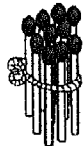
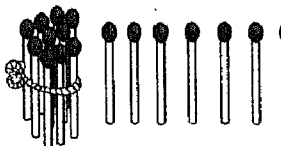
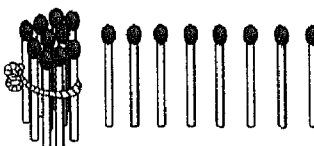
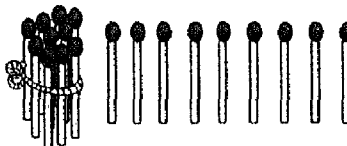
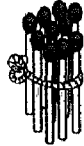
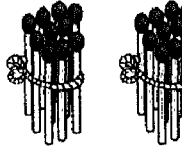

दहाई	इकाइयाँ

दस से बीस तक की संख्याएँ

रिक्त स्थानों में भरिए।

रिक्त स्थानों में भरिए।

तालिका पूरी करना

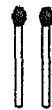
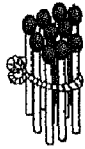
 = 10

1 दहाई

10	10			

 = 11

1 दहाई 1 इकाई

11	11			

= 12

1 दहाई 2 इकाइयाँ

12	12			

तालिका पूरी करना

 = 13

1 दहाई   3 इकाइयाँ

13	13			

  = 14

1 दहाई   4 इकाइयाँ

14	14			

  = 15

1 दहाई   5 इकाइयाँ

15	15			

तालिका पूरी करना

= 16

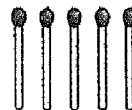
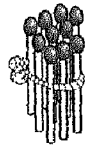
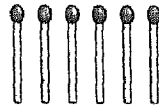
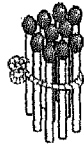
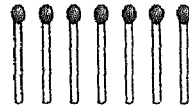
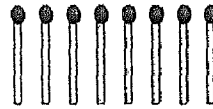
1 दहाई 6 इकाइयाँ

16	16			

= 17

1 दहाई 7 इकाइयाँ

17	17			

= 18

1 दहाई 8 इकाइयाँ

18	18			

तालिका पूरी करना

 = 19

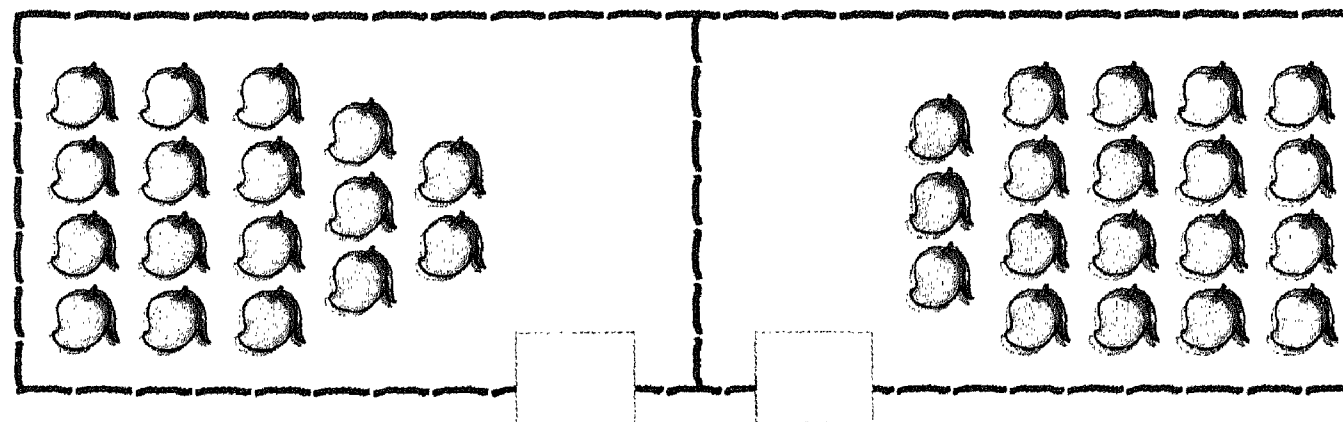
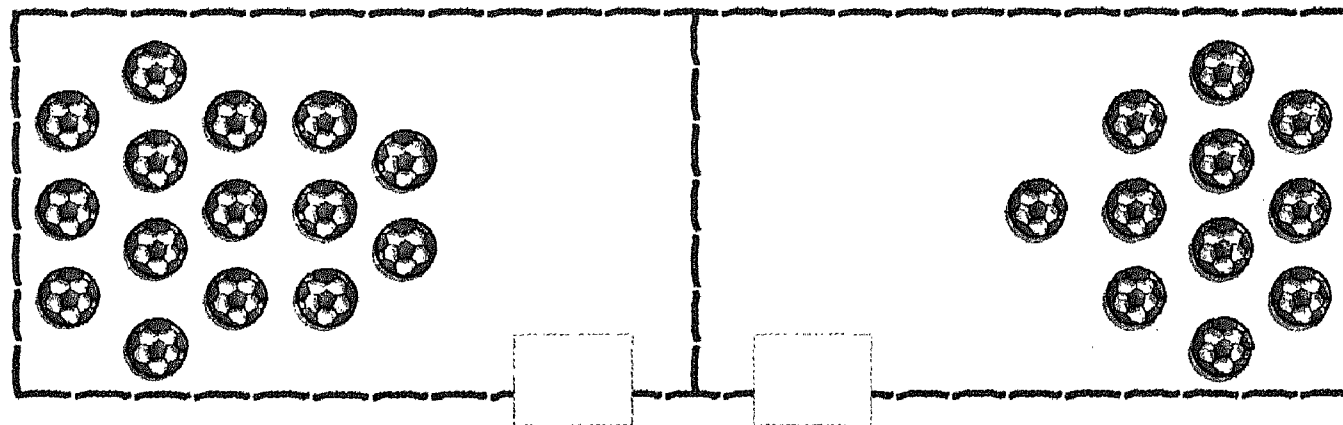
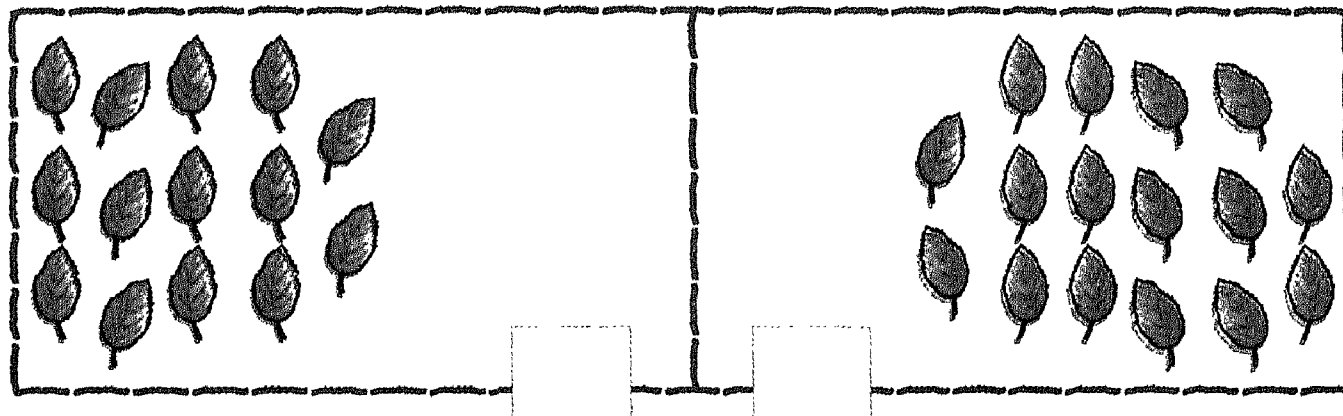
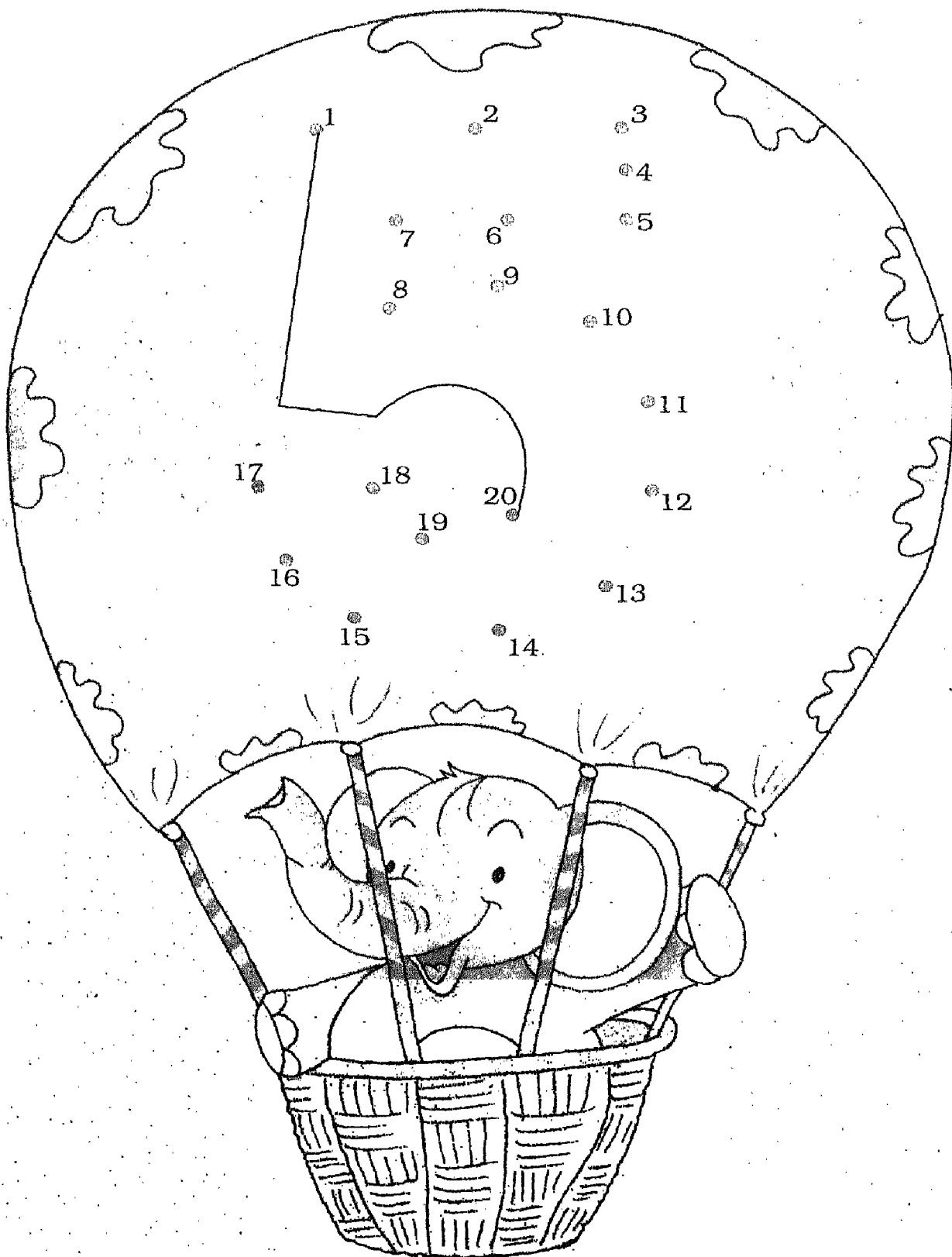
1 दहाई 9 इकाइयाँ

19	19			

  = 20

1 दहाई 1 दहाई 2 दहाइयाँ

20	20			

अधिक वस्तुओं वाले समूह पर (✓) निशान लगाइए।

क्रम से मिलाइए।

छूटी हुई संख्याएँ लिखिए।

10 12 15

16 18 13 15

18 के बाद क्या आता है?

18

14 के बाद क्या आता है?

14

16 से पहले क्या आता है?

16 17

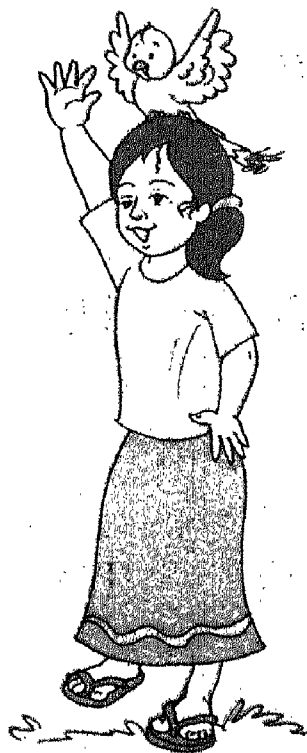
9 से पहले तथा 9 के बाद की संख्याएँ लिखिए।

9

18 से पहले तथा 18 के बाद की संख्याएँ लिखिए।

18

10 से पहले तथा 10 के बाद की संख्याएँ लिखिए।

10

बड़ी संख्या पर घेरा बनाइए।

11	13	13	15	18	8
12	8	17	7	11	10
16	6	1	11	9	19

छोटी संख्या पर घेरा बनाइए।

20	10	6	4	10	12
11	9	5	15	12	2
16	17	9	10	15	13

सबसे बड़ी संख्याओं पर घेरा बनाइए।

 13 3 9 12 15 20

10 5 12 11 12 13

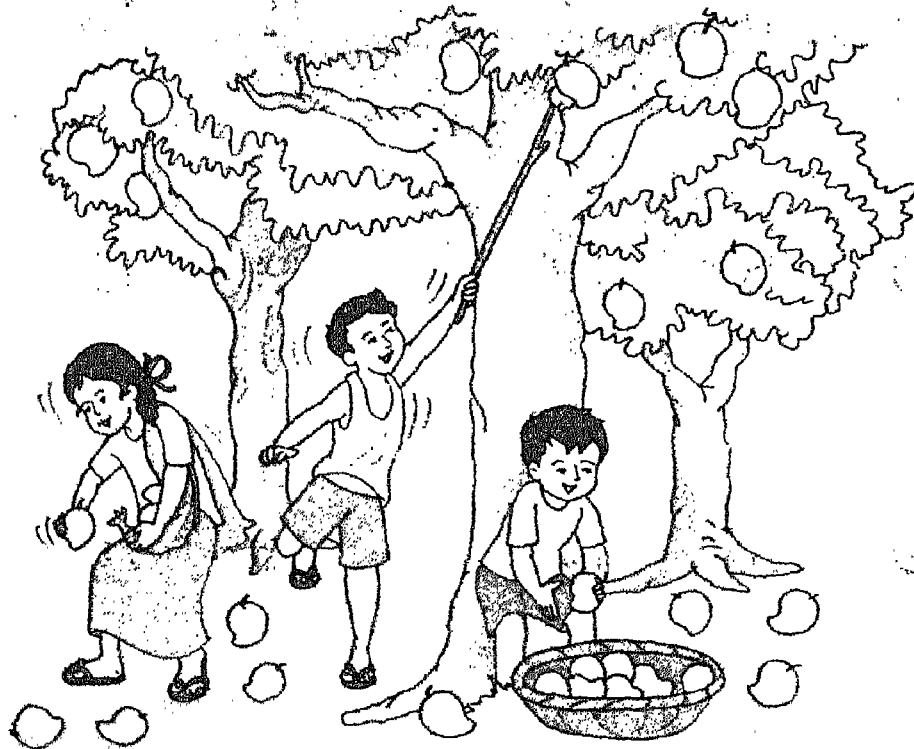
19 18 17 13 16 14

सबसे छोटी संख्याओं पर घेरा बनाइए।

7 2 4 14 16 12

15 7 20 19 8 9

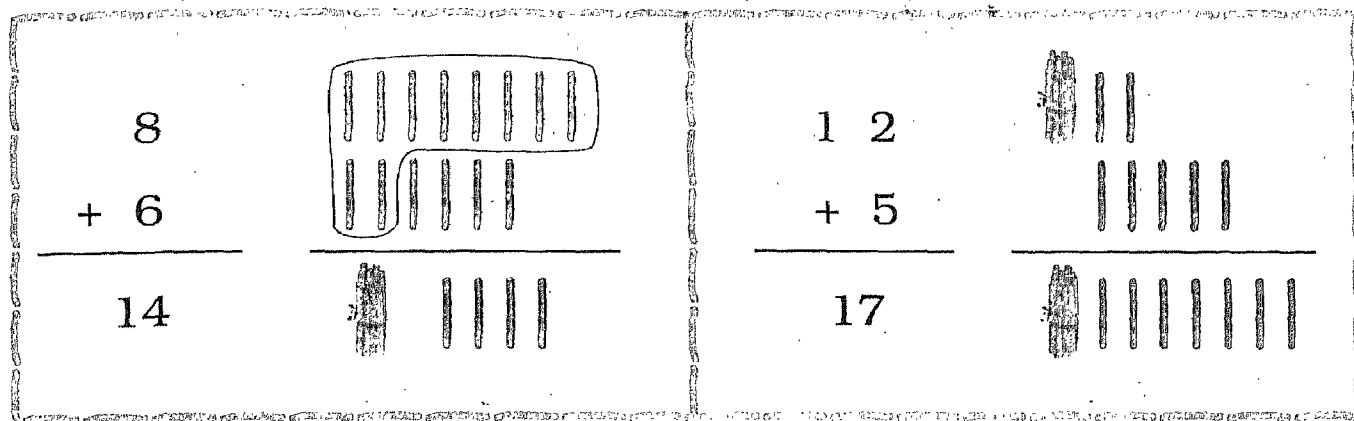
1 10 20 16 15 14

जोड़िए

$4 + 5 =$

$0 + 3 =$

$5 + 2 =$

$6 + 2 =$

$$\begin{array}{r} 6 \\ +\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 0 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 1 \\ +\ 7 \\ \hline \end{array}$$

$8 + 7 =$

$11 + 15 =$

$9 + 9 =$

$4 + 12 =$

$8 + 5 =$

$13 + 5 =$

$6 + 7 =$

$0 + 14 =$

$$\begin{array}{r} 5 \\ +\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 7 \\ +\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 5 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ +\ 7 \\ \hline \end{array}$$

1. राहुल के पास 8 पेंसिलें हैं। सोनू के पास 7 पेंसिलें हैं। उन दोनों के पास कुल कितनी पेंसिलें हैं?

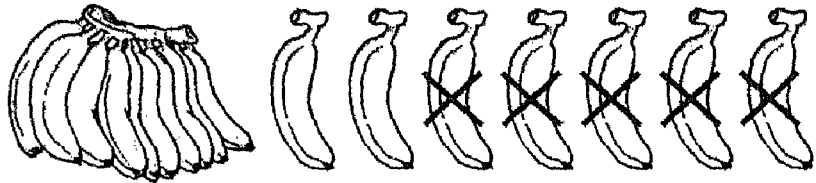
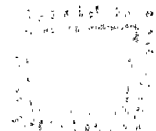
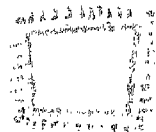
2. फरीदा ने 4 सेब तोड़े। सीता ने 6 सेब तोड़े। दोनों ने सेबों को एक साथ मिला दिया। अब कुल कितने सेब हुए?

घटाइए

$7 - 4 =$ 　　　　 $9 - 8 =$

$2 - 2 =$ 　　　　 $6 - 2 =$

$$\begin{array}{r} 8 \\ -\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ -\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ -\ 0 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \\ -\ 5 \\ \hline 12 \end{array}$$

$15 - 4 =$ ☐ 　　　　 $17 - 2 =$ ☐

$19 - 7 =$ ☐ 　　　　 $12 - 1 =$ ☐

$18 - 8 =$ ☐ $14 - 3 =$ ☐

$17 - 5 =$ ☐ $12 - 4 =$ ☐

$11 - 1 =$ ☐ $13 - 0 =$ ☐

$$\begin{array}{r} 17 \\ -\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 18 \\ -\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 15 \\ -\ 5 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \\ -\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 14 \\ -\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ 6 \\ \hline \end{array}$$

1. सोहन की माताजी बाजार से 9 केले लाईं। उन्होंने 4 केले सोहन को दे दिए। उनके पास कितने केले शेष रह गए।

2. रहीम के पास 8 फूल थे। उसने 3 फूलों को फूलदान में रख दिया। उसके पास कितने फूल शेष रहे।

जोड़ का अभ्यास करना।

$3 + 7 =$

$7 + 6 =$

$5 + 8 =$

$9 + 2 =$

$6 + 8 =$

$8 + 7 =$

$9 + 9 =$

$4 + 8 =$

घटाव का अभ्यास करना।

$13 - 7 =$

$16 - 6 =$

$15 - 3 =$

$12 - 0 =$

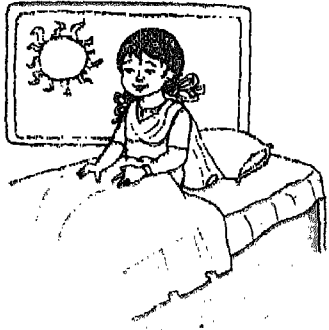
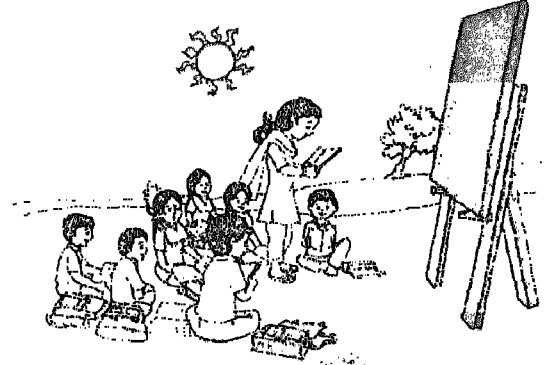
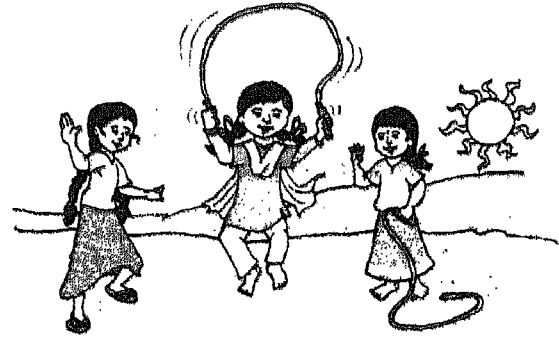
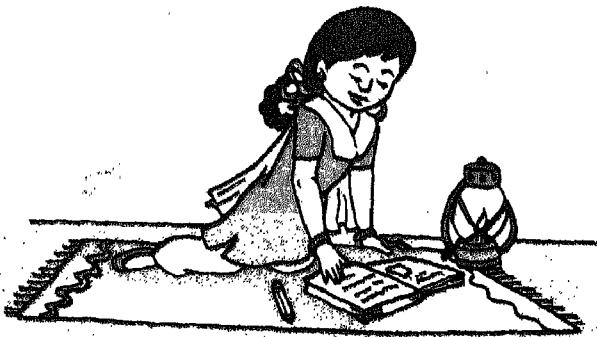
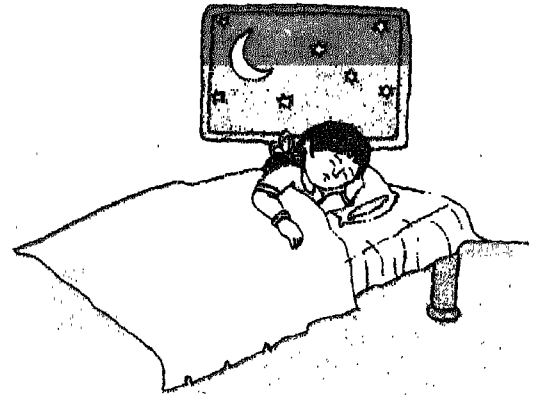
$19 - 6 =$

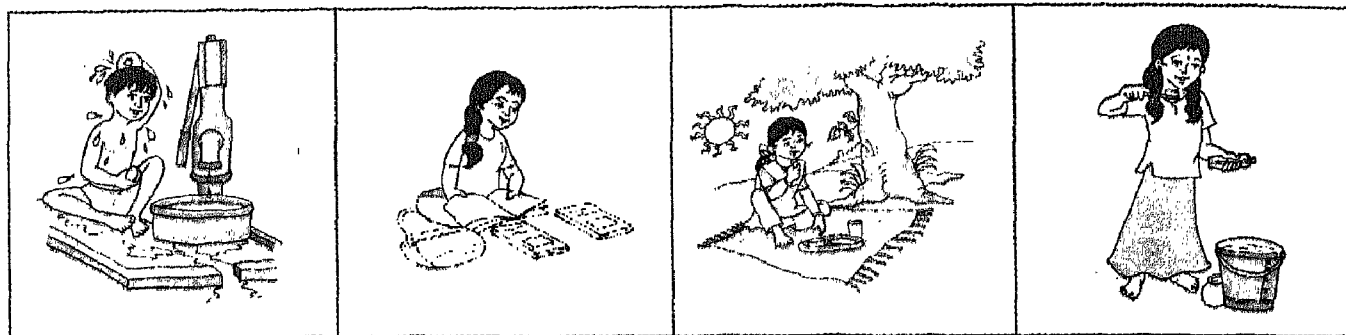
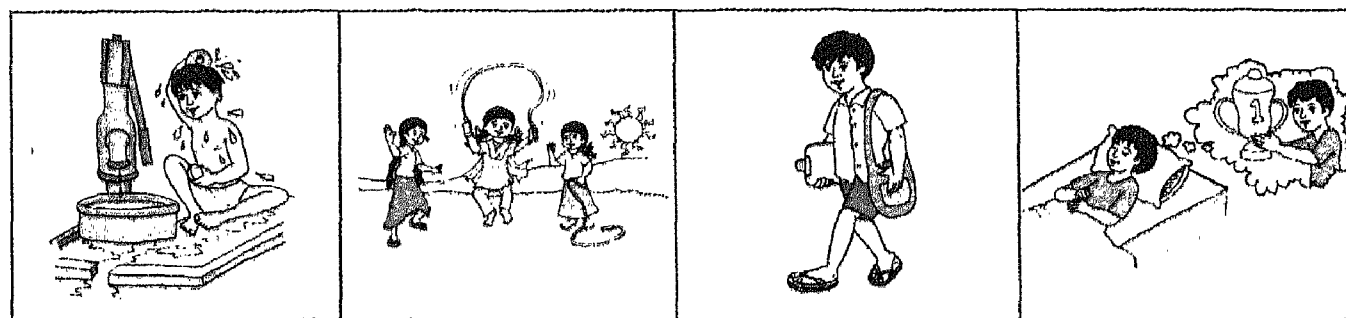
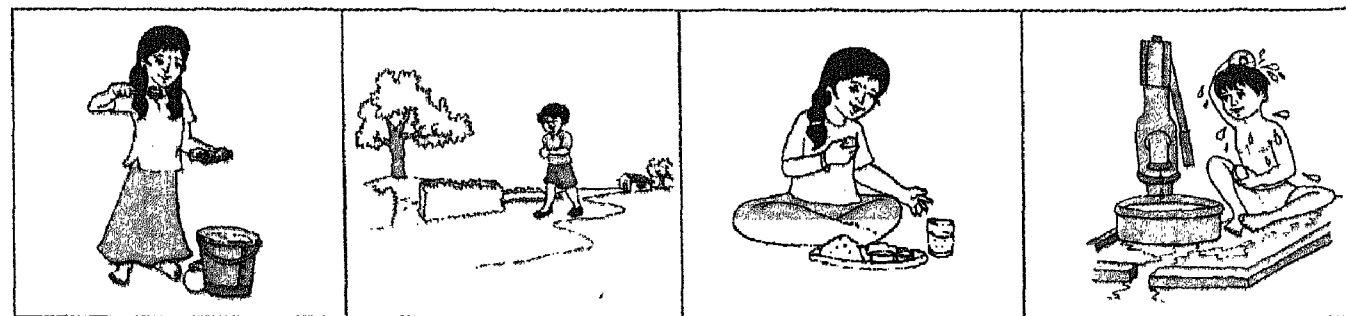
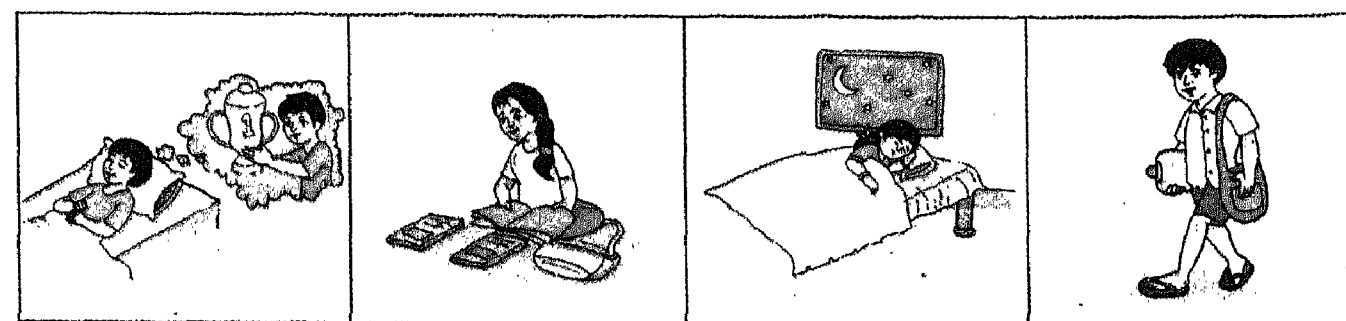
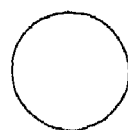
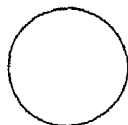
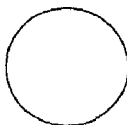
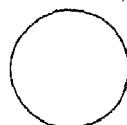
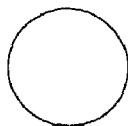
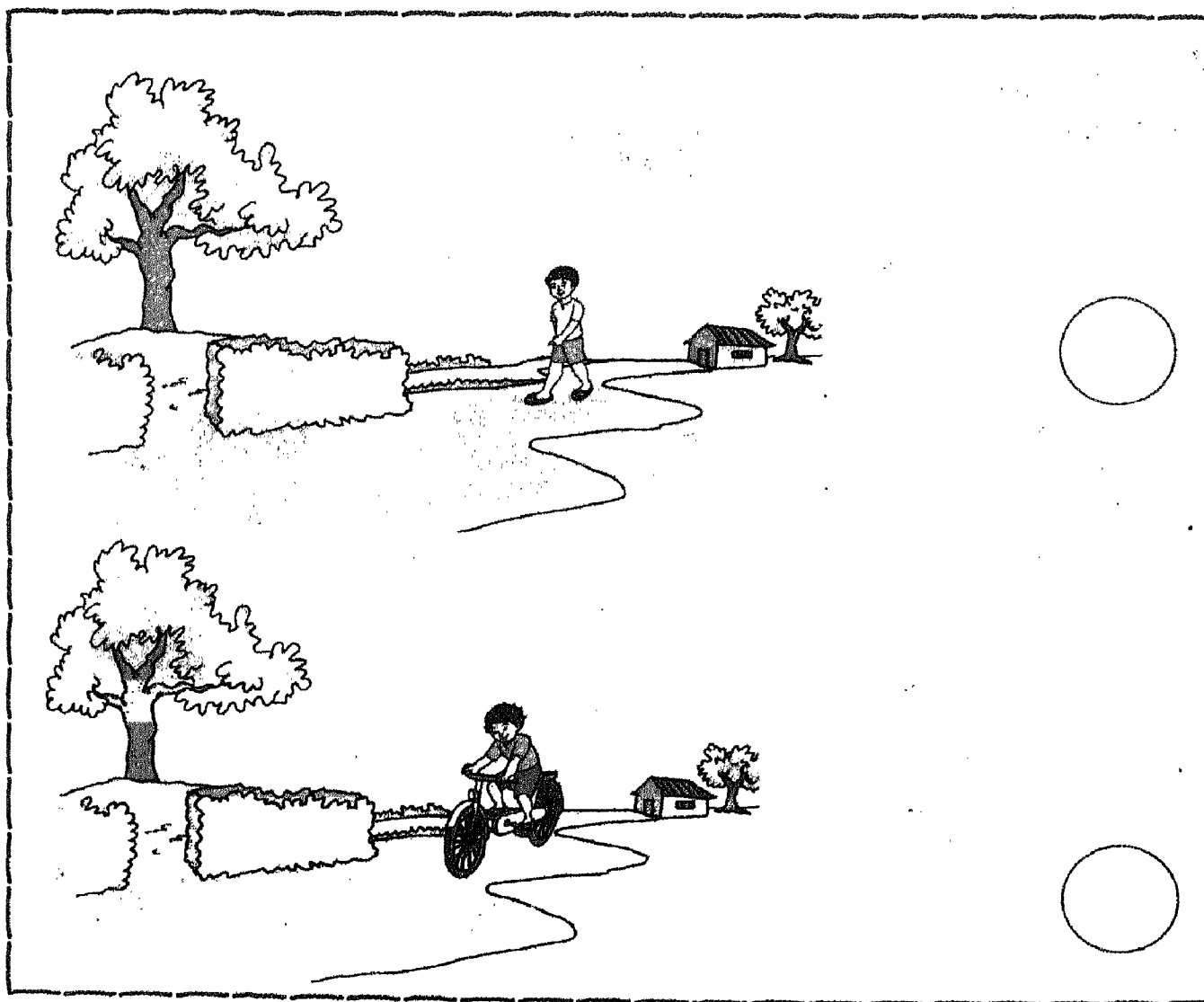
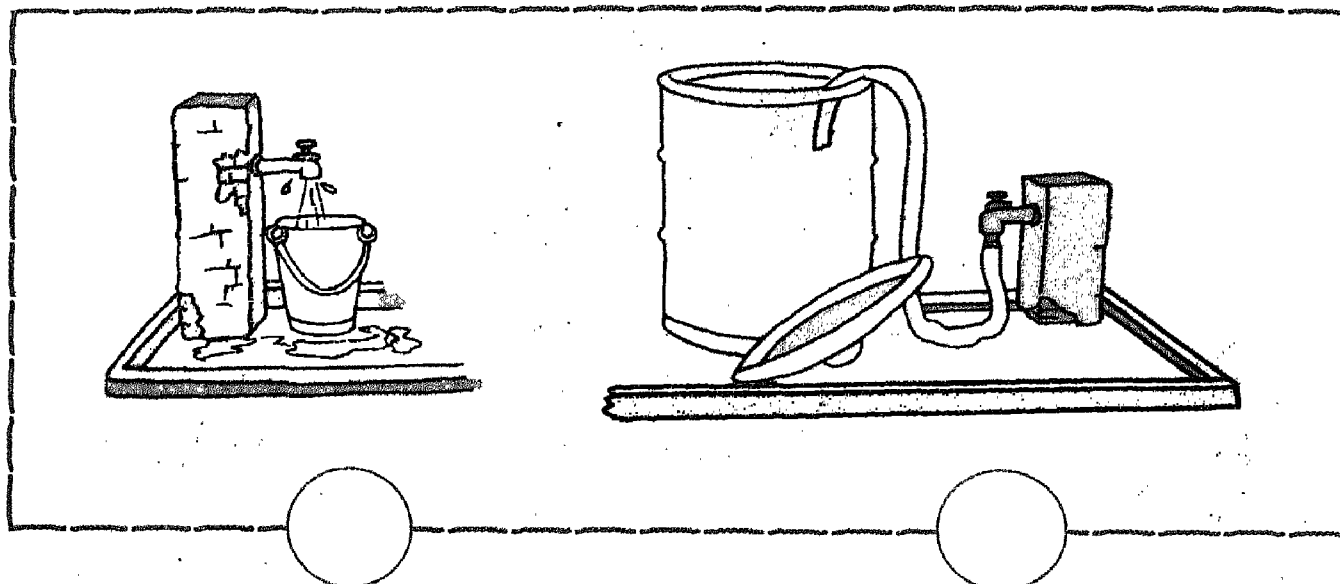
$14 - 3 =$

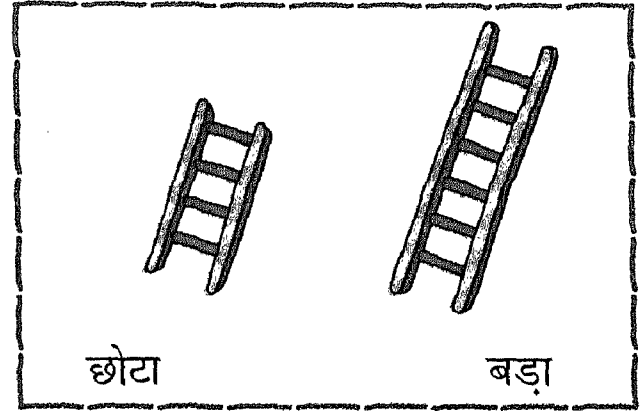
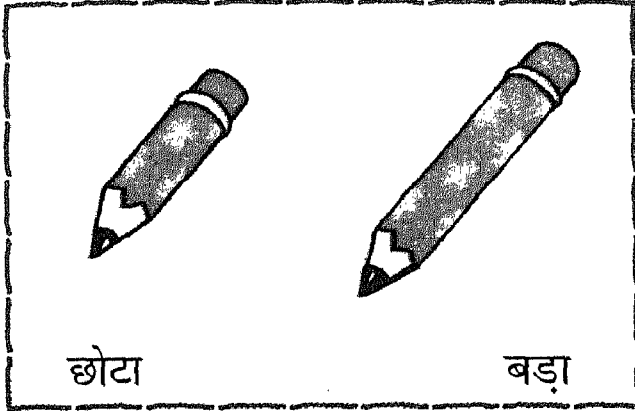
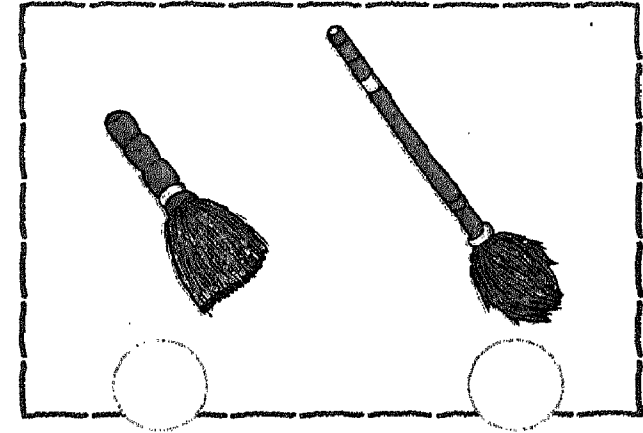
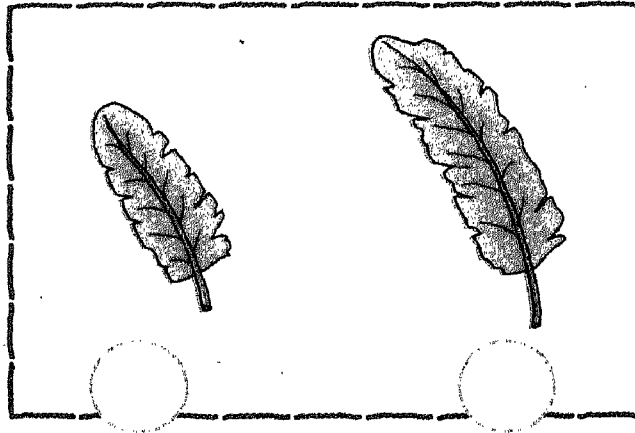
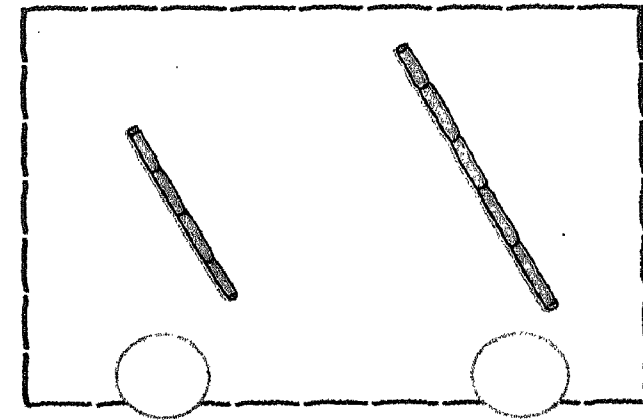
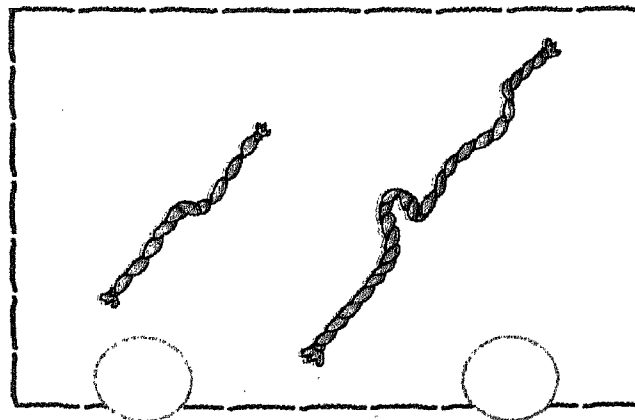
$17 - 4 =$

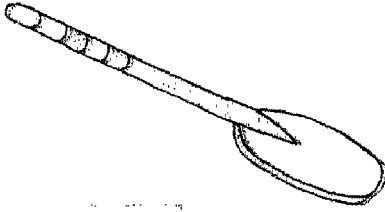
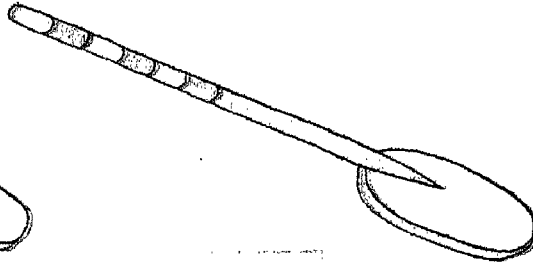
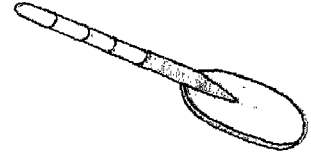
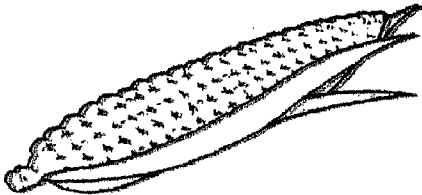
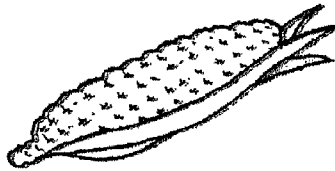
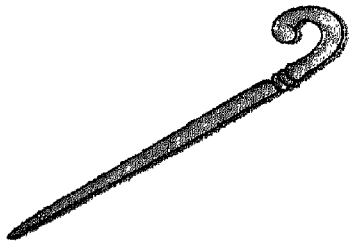
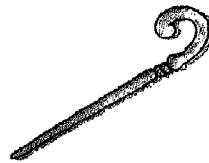
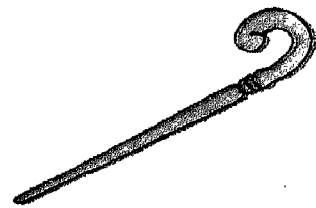
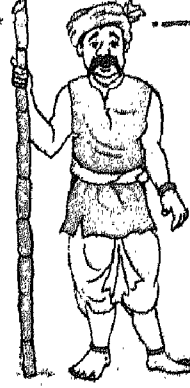
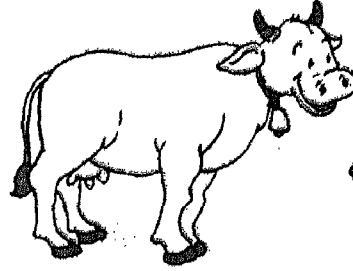
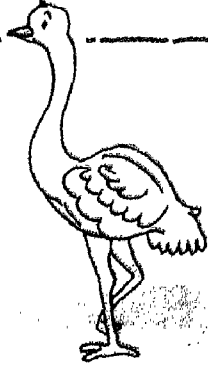
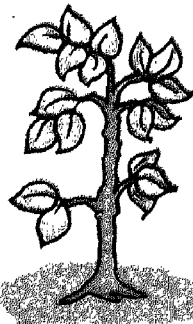
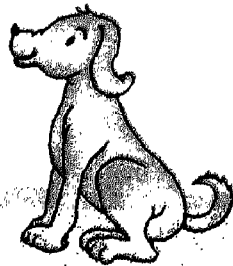
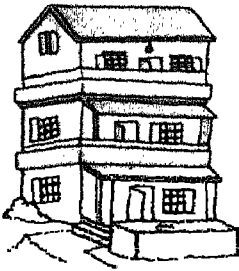
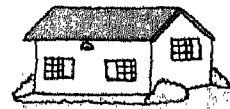
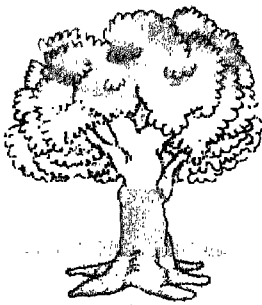
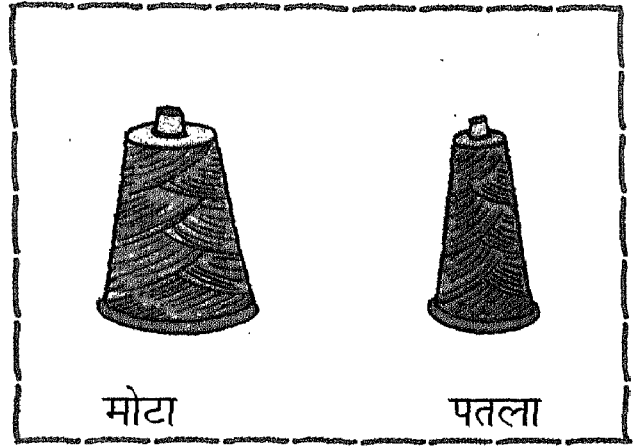
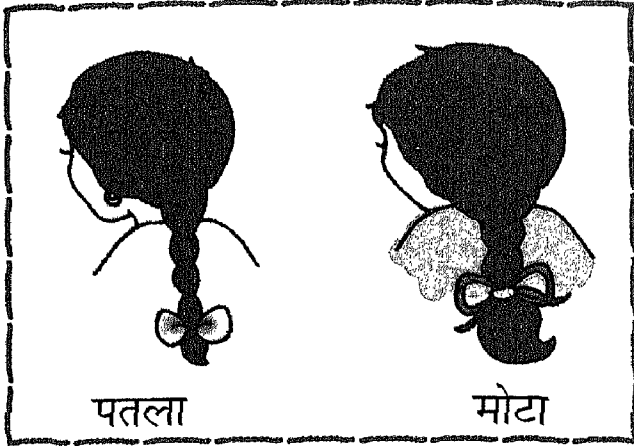
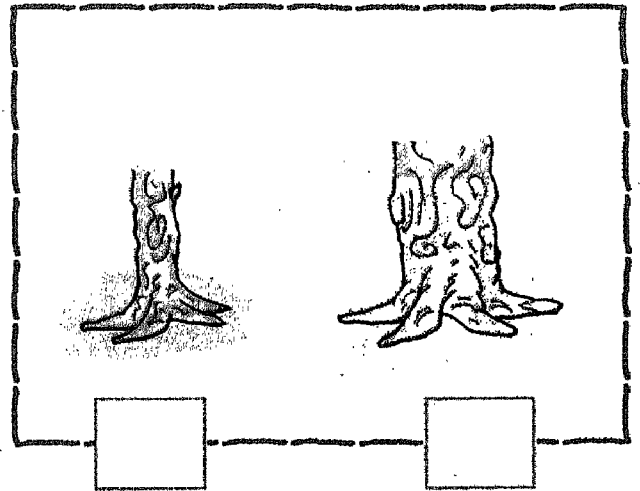
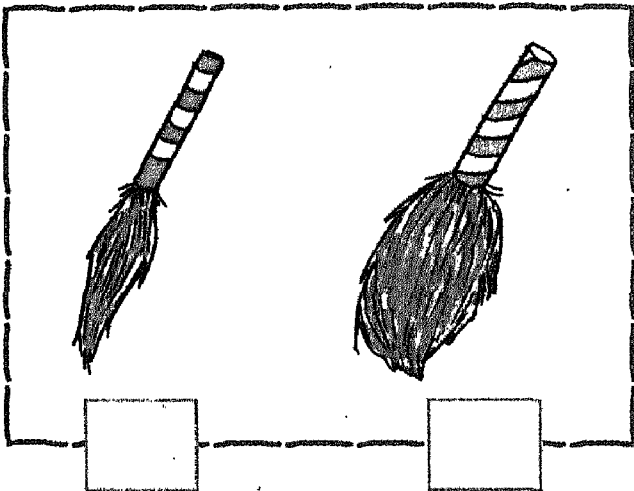
$18 - 7 =$

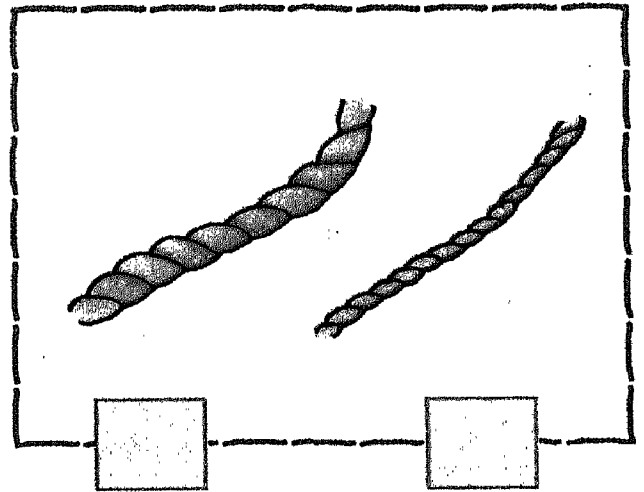
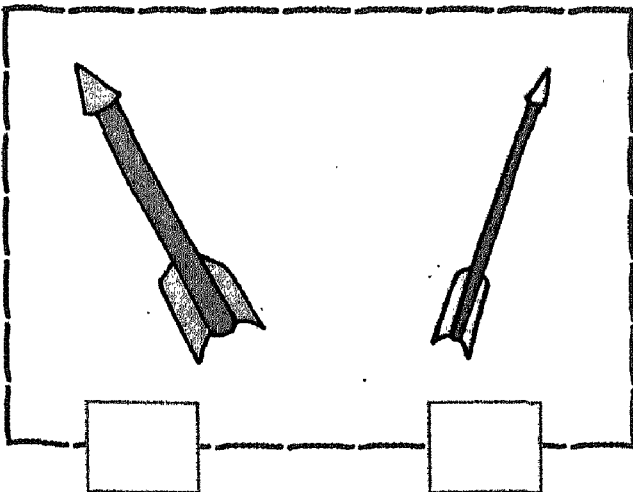
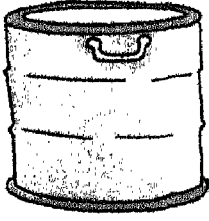
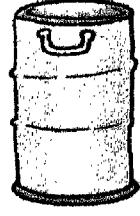
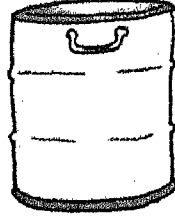
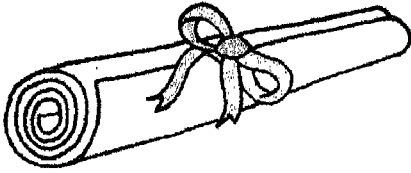
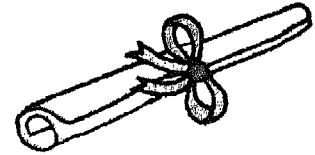
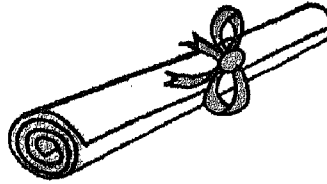
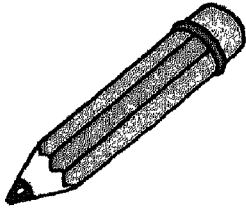
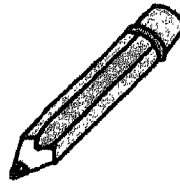
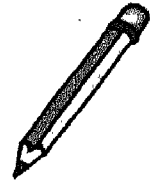
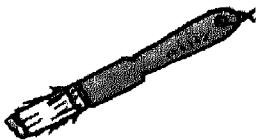
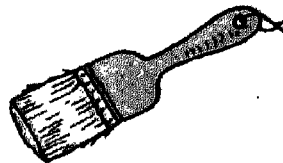
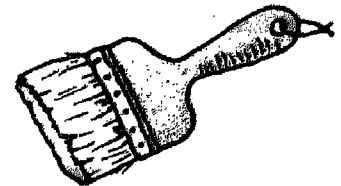
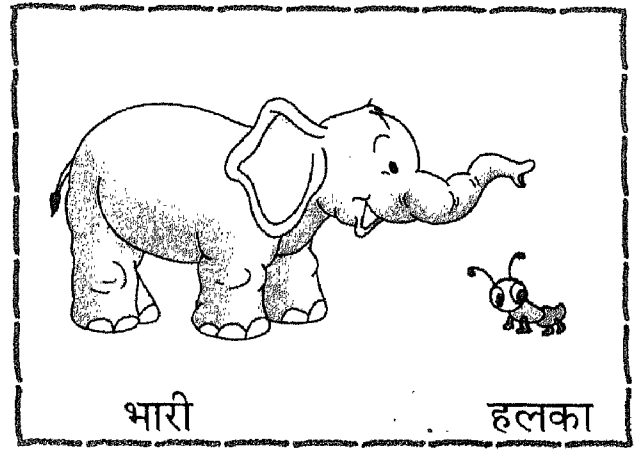
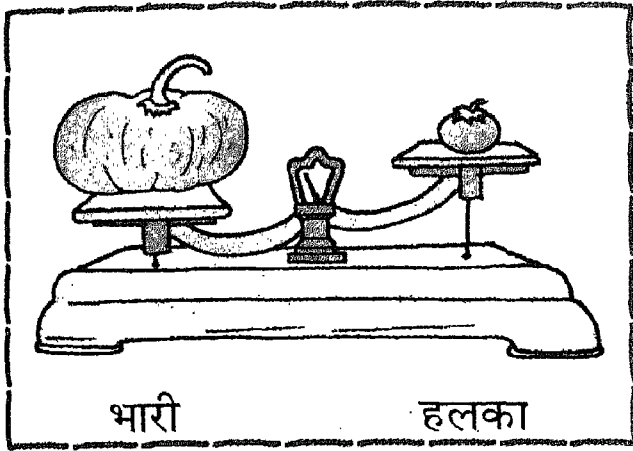
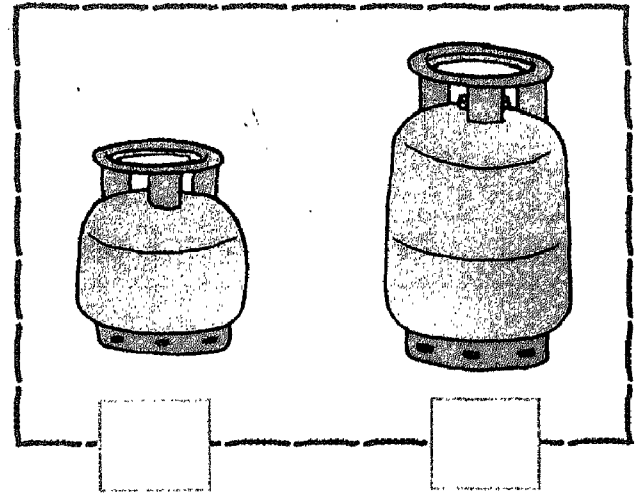
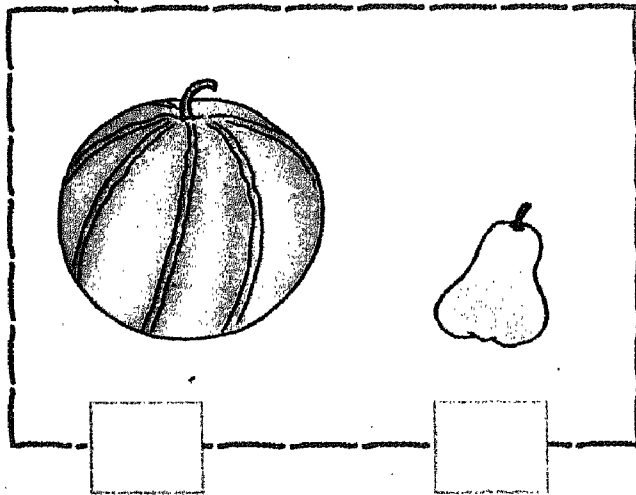
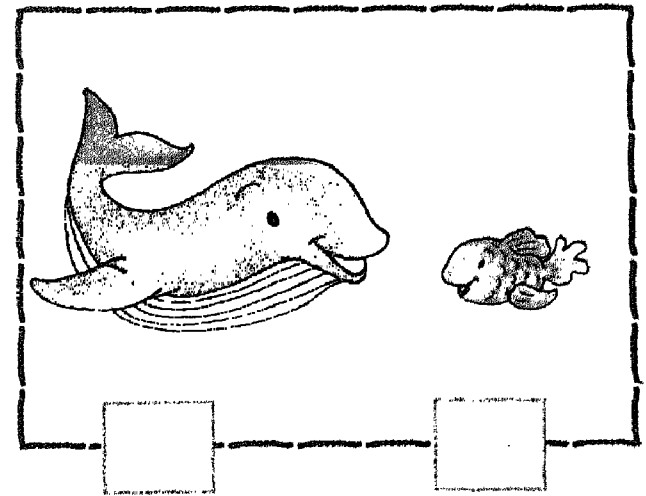
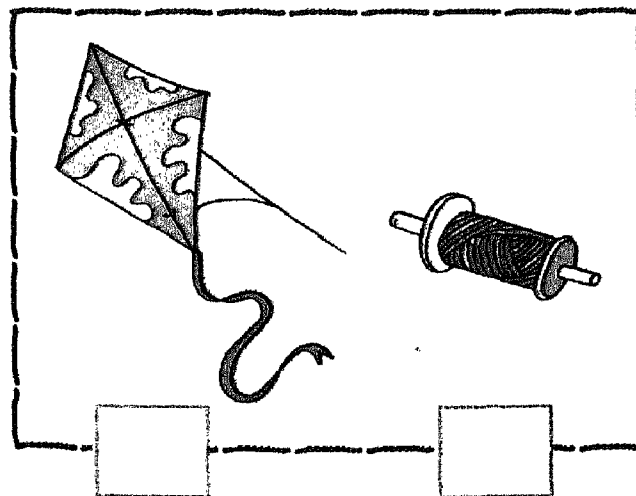
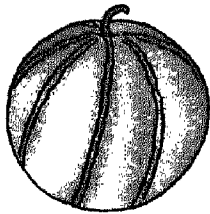
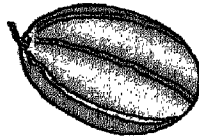
समय

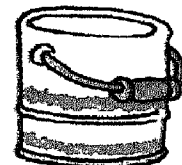
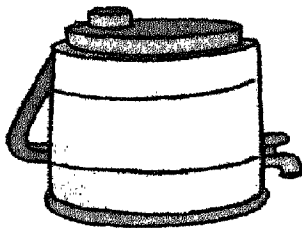
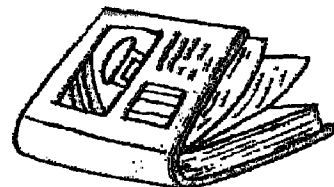
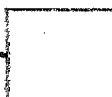
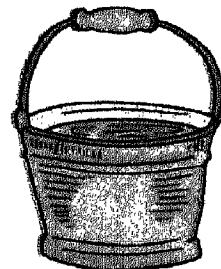
सम्पदा की दिनचर्या

1. स्कूल के लिए उठना 2. नाश्ता करना 3. स्कूल में कहानी पढ़ना

4. दोपहर का भोजन करना

5. खेलना

6. अध्ययन करना

7. सोना

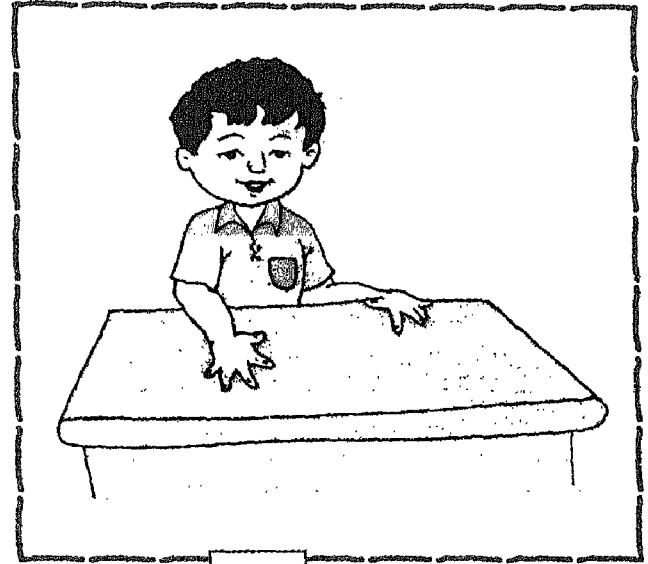
अपने प्रातः के क्रियाकलापों पर (✓) निशान लगाइए।

अपने सायं के क्रियाकलापों पर (✓) निशान लगाइए।

अपने दिन के क्रियाकलापों पर (✓) निशान लगाइए।

अपने रात्रि के क्रियाकलापों पर (✓) निशान लगाइए।

क्रियाकलापों के अनुसार क्रम से नंबर दीजिए।

अधिक समय में पूरा होने वाले क्रियाकलापों पर (✓) निशान लगाइए।

माप

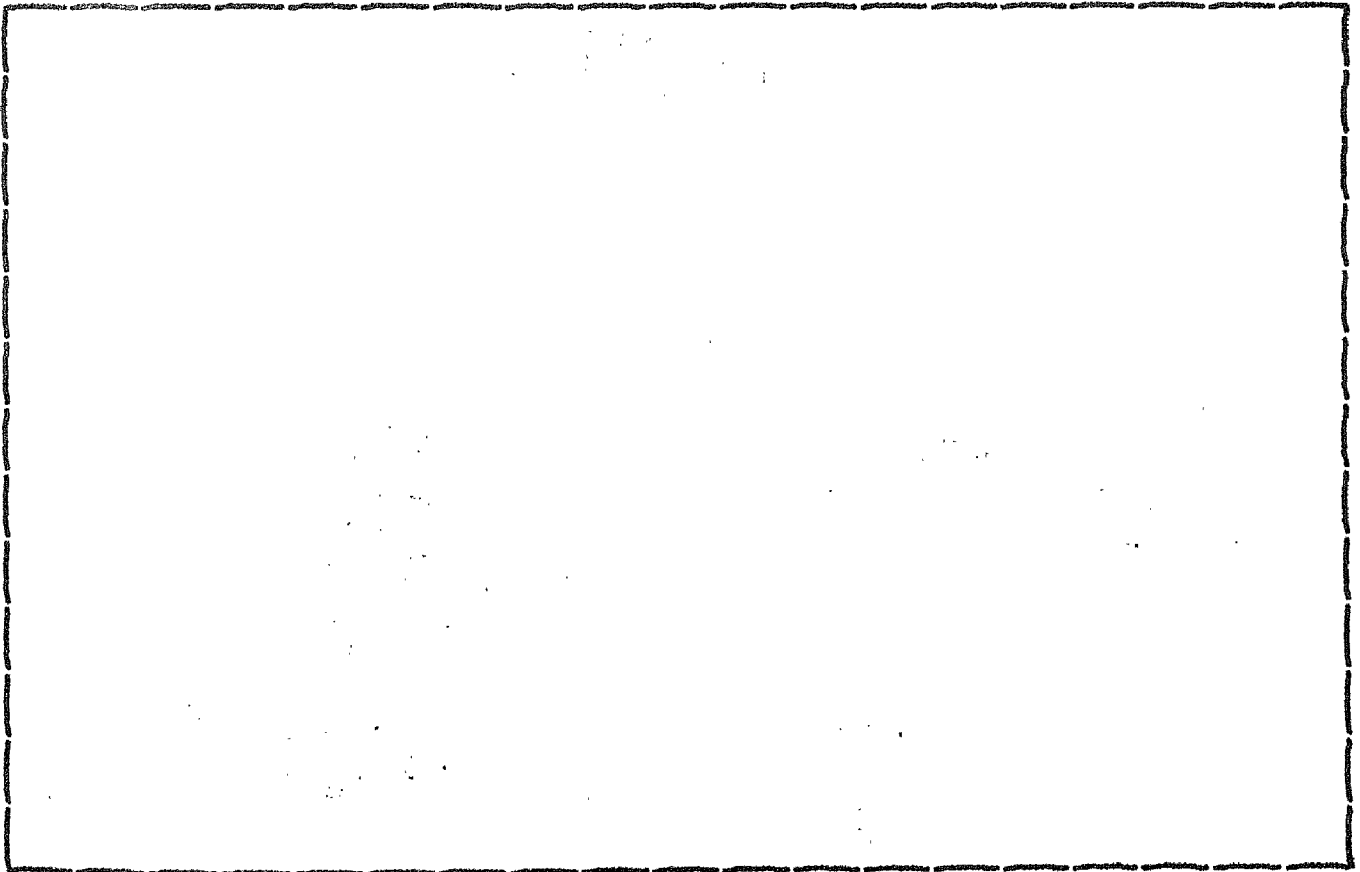
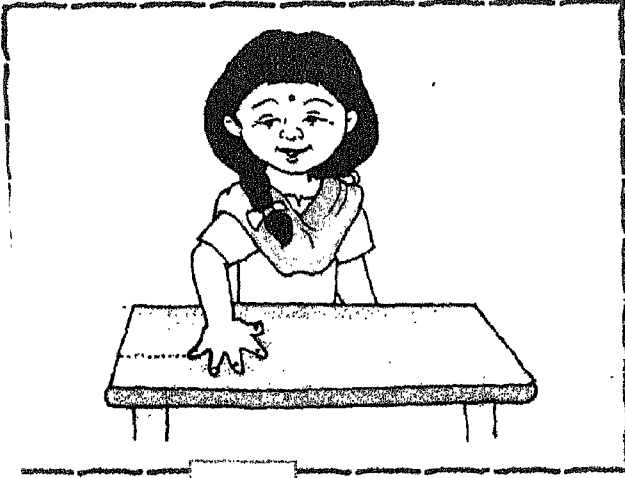
लंबा-छोटा

लंबे पर (✓) निशान लगाइए।

छोटे पर (✓) निशान लगाइए।

सबसे लंबा-सबसे छोटा

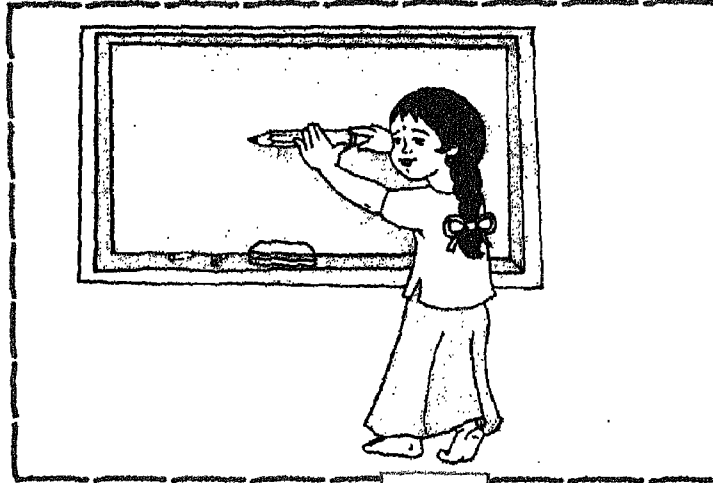
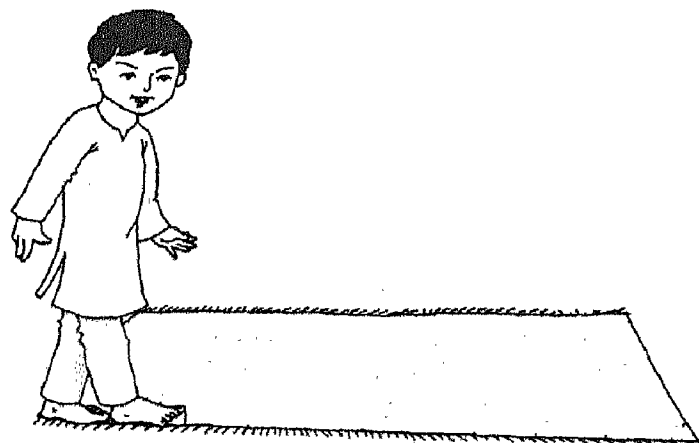
सबसे लंबे पर (✓) निशान लगाइए।

सबसे छोटे पर (✓) निशान लगाइए।

ऊँचा-नीचा

ऊँचे पर (✓) निशान लगाइए।

नीचे पर (✓) निशान लगाइए।

सबसे ऊँचा-सबसे नीचा

मोटा-पतला

मोटे पर (✓) निशान लगाइए।

पतले पर (✓) निशान लगाइए।

सबसे मोटा-सबसे पतला

सबसे मोटे पर (✓) निशान लगाइए।

सबसे पतले पर (✓) निशान लगाइए।

भारी-हलका

हलके पर (✓) निशान लगाइए।

भारी पर (✓) निशान लगाइए।

सबसे भारी-सबसे हलका

सबसे भारी

सबसे हलका

सबसे भारी पर (✓) निशान लगाइए।

सबसे हलके पर (✓) निशान लगाइए।

सबसे भारी पर (✓) निशान लगाइए।

माप

यह किताब 3 बालिश्त लंबी है।

यह मेज़ ____ बालिश्त लंबी है।

अपने दोस्त के हाथ की बालिश्त की छाप बनाइए।

माप

मेरी मेज़ ☐ बालिश्त लंबी है।

मेरी पेंसिल ☐ बालिश्त लंबी है।

मेरी कक्षा का श्यामपट ☐ पेंसिलें लंबा है।

यह कालीन 10 पाँव लंबी है।

यह चटाई 6 पाँव लंबी है।

दूरी का अनुमान लगाइए।

21 से 50 तक की संख्याएँ

खाली स्थान भरिए।

संख्या लिखिए

दहाई इकाइयाँ

दहाई	इकाइयाँ
1	4

14

दहाई इकाइयाँ

दहाई	इकाइयाँ

दहाई इकाइयाँ

दहाई	इकाइयाँ

बंडल और इकाइयाँ बनाइए।

दहाई इकाइयाँ

दहाई	इकाइयाँ
1	5

15

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ
2	0

20

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ
2	2

22

संख्याएँ लिखिए

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ	
2	5	25

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ	
3	3	33

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ	
2	3	

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ	
4	2	

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ	

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ	

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ	

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ	

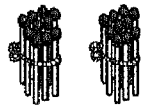
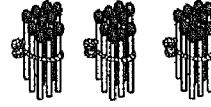
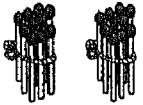
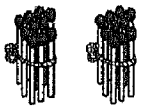
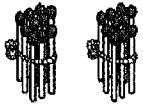
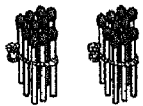
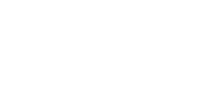
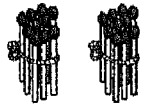
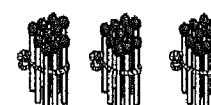
दहाइयाँ इकाइयाँ

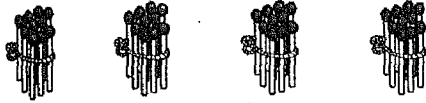
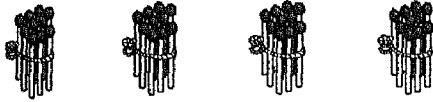
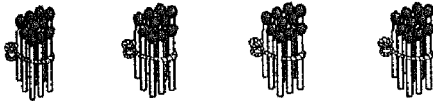
दहाइयाँ	इकाइयाँ	

दहाइयाँ इकाइयाँ

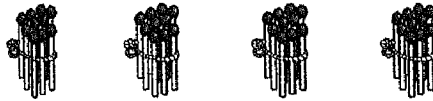
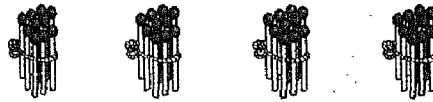
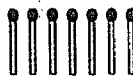
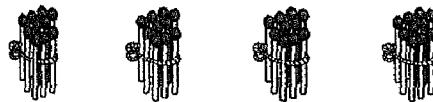
दहाइयाँ	इकाइयाँ	

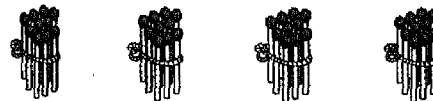
21 से 40 तक की संख्याएँ

खाली स्थान भरिए।

दहाइयाँ	इकाइयाँ	संख्या	दहाइयाँ	इकाइयाँ	संख्या
2 दहाइयाँ	1 इकाई	21	3 दहाइयाँ	1 इकाई	31
2 दहाइयाँ	2 इकाइयाँ	22	3 दहाइयाँ	2 इकाइयाँ	
2 दहाइयाँ	3 इकाइयाँ	23	3 दहाइयाँ	3 इकाइयाँ	
2 दहाइयाँ	4 इकाइयाँ		3 दहाइयाँ	4 इकाइयाँ	
2 दहाइयाँ	5 इकाइयाँ		3 दहाइयाँ	5 इकाइयाँ	
2 दहाइयाँ	6 इकाइयाँ		3 दहाइयाँ	6 इकाइयाँ	36
2 दहाइयाँ	7 इकाइयाँ	27	3 दहाइयाँ	7 इकाइयाँ	
2 दहाइयाँ	8 इकाइयाँ	28	3 दहाइयाँ	8 इकाइयाँ	38
2 दहाइयाँ	9 इकाइयाँ	29	3 दहाइयाँ	9 इकाइयाँ	39
2 दहाइयाँ	1 दहाई	30	3 दहाइयाँ	1 दहाई	40

41 से 50 तक की संख्याएँ

खाली स्थान भरिए।

4 दहाइयाँ 1 इकाई 41

4 दहाइयाँ 2 इकाइयाँ

4 दहाइयाँ 3 इकाइयाँ 43

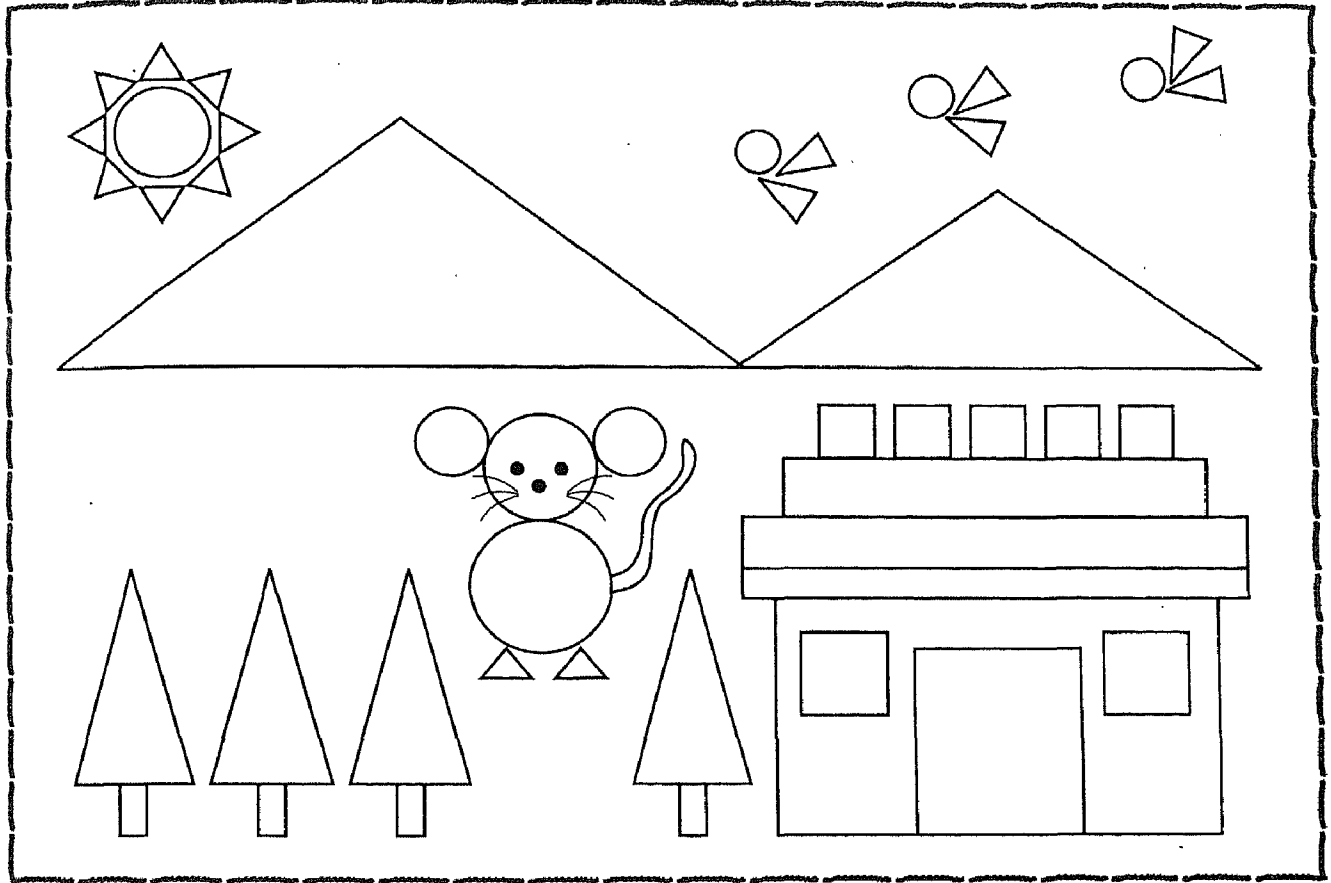
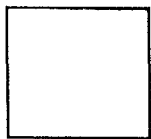
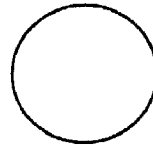
4 दहाइयाँ 4 इकाइयाँ

4 दहाइयाँ 5 इकाइयाँ 45

4 दहाइयाँ 6 इकाइयाँ

4 दहाइयाँ 7 इकाइयाँ 47

4 दहाइयाँ 8 इकाइयाँ 48

4 दहाइयाँ 9 इकाइयाँ 49

4 दहाइयाँ 1 दहाई 50

छूटी हुई संख्याएँ लिखिए

1	2	3	4	5	6	7	8	9	10
11		13			16				
	22					27			
							38		
		43						49	

आंकड़े बनाना

ऊपर के चित्र में बनी हुई आकृतियों को गिनिए।

आकृतियों के नाम लिखिए

जो सबसे अधिक बार आई हैं

जो सबसे कम बार आई हैं

ये सभी बच्चे आपस में मित्र हैं।

प्रत्येक बच्चे के नाम में आए अक्षरों को गिनिए और लिखिए

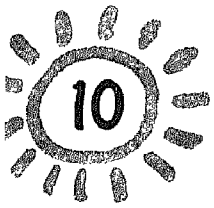
नाम							अक्षरों की संख्या
श	ब	न	म				
जो	स	फ़					
य	श	पा	ल				
उ	द	य					
सु	हा	सि	नी				
अ	म	र	पा	ल			
स	म	र	जी	त			
श	या	मा					
अ	ह	म	द				

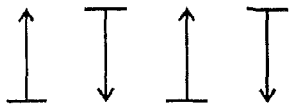
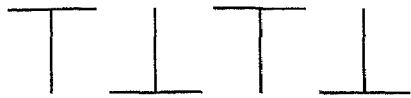
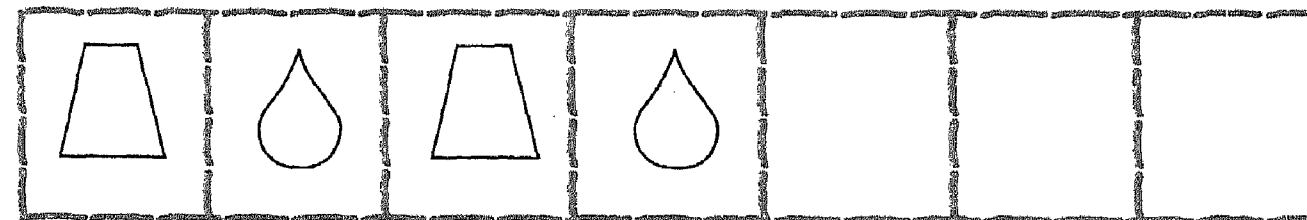
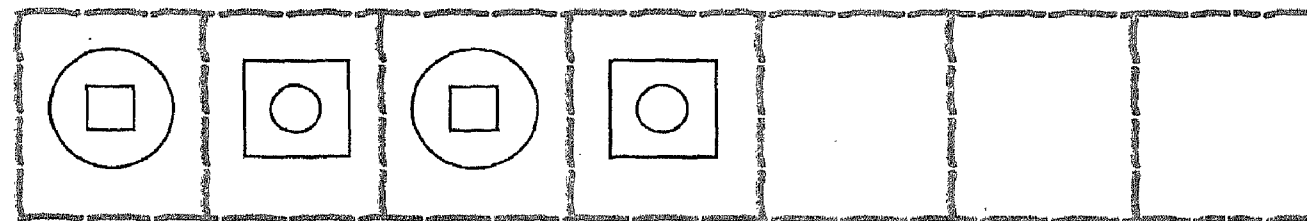
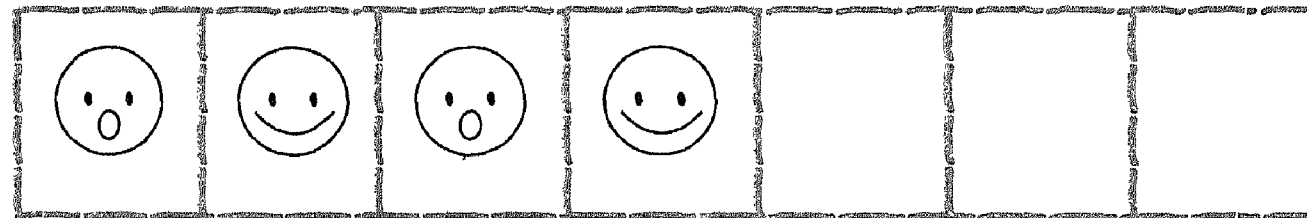
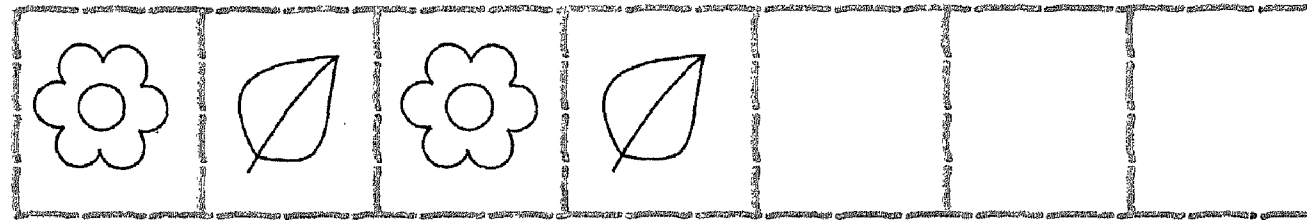
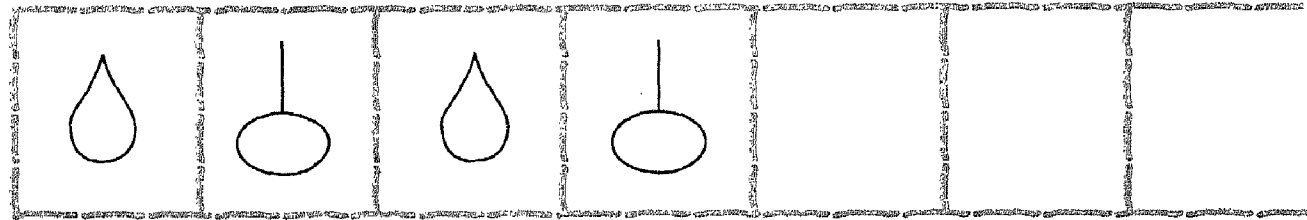
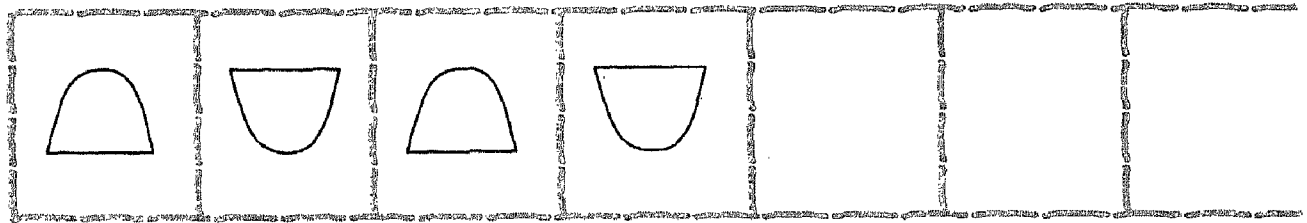
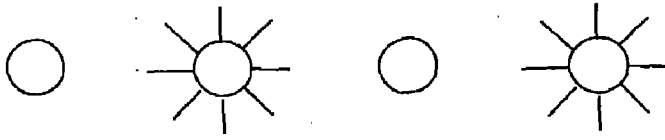
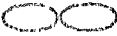
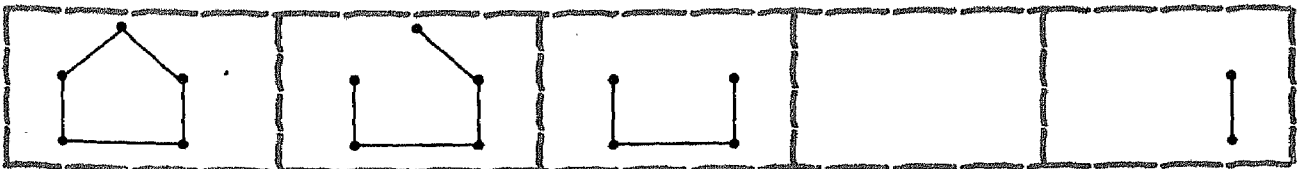
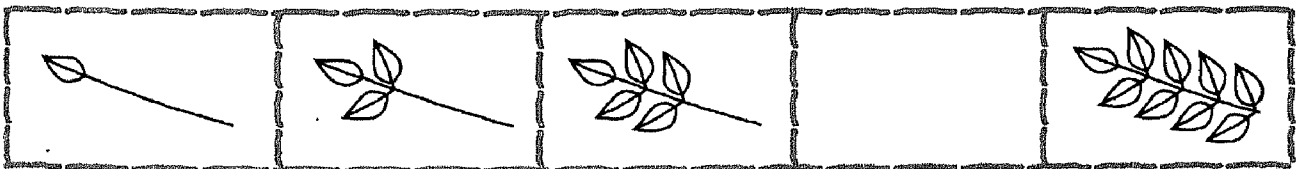
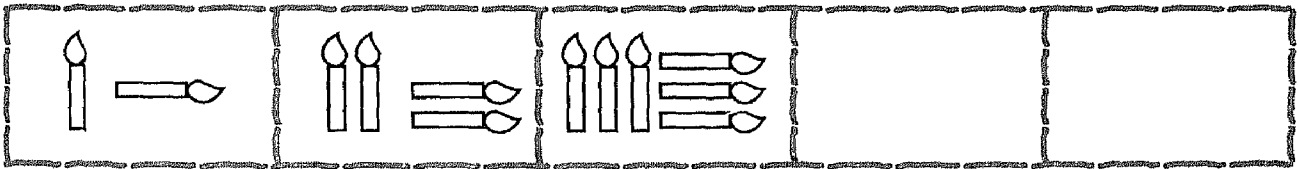
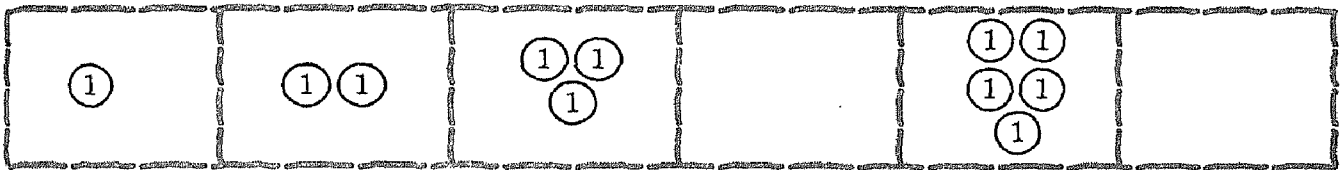
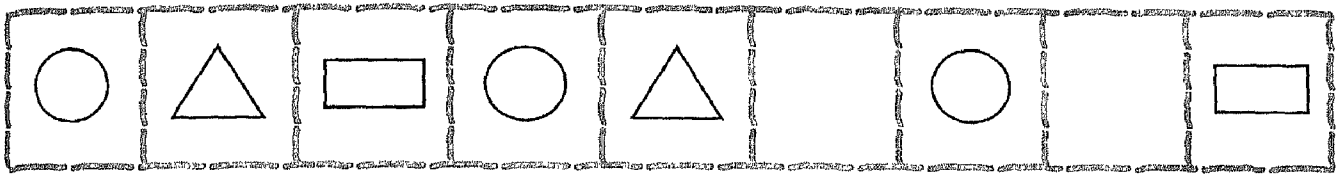
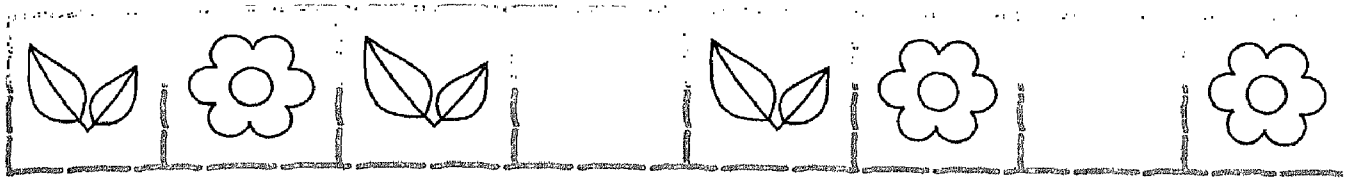
कितने नामों में तीन अक्षर आए हैं।

कितने नामों में चार अक्षर आए हैं।

कितने नामों में पाँच अक्षर आए हैं।

ऊपर लिखे सभी नामों में म कितनी बार आया है?

ऊपर लिखे सभी नामों में य कितनी बार आया है?

आकृतियाँ बनाना

इसी क्रम में आगे बनाइए।

इसी क्रम में अगला क्या होगा?

आकृतियों के पैटर्न

बाक्सों को क्रम में भरिए।

पैटर्न का अध्ययन कीजिए और छूटी हुई संख्याएँ भरिए।

पैटर्न को पूरा कीजिए।

पैटर्न को पूरा कीजिए।

2 4 6 8

27 28 29

25 30 40

1 4 7

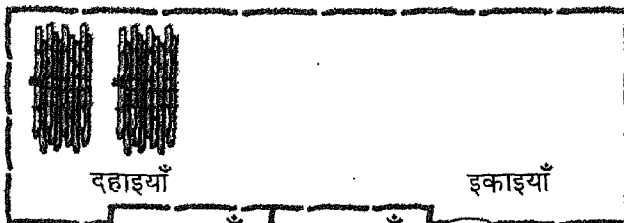
15 13 11

संख्याएँ

संख्या लिखिए

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ
3	4

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ

संख्याओं के बंडल और इकाइयाँ बनाइए

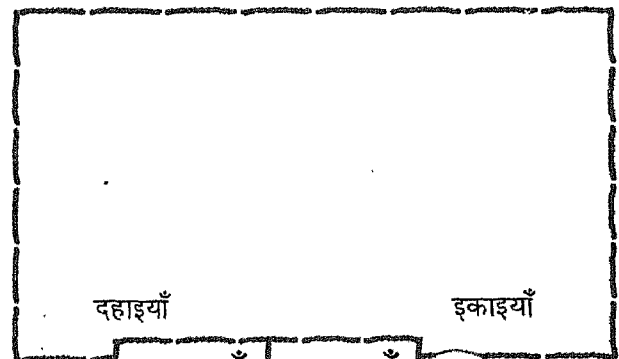
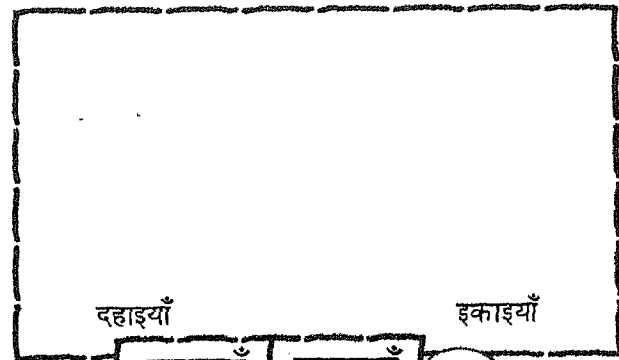
दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ

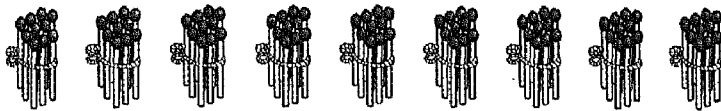
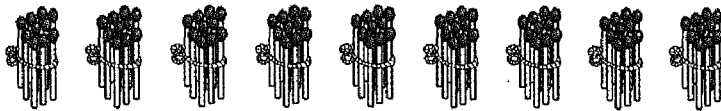
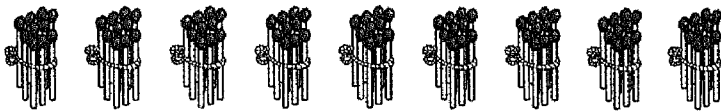
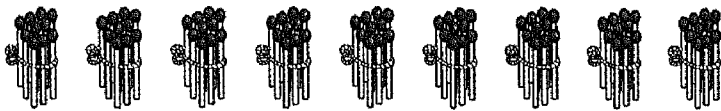
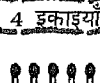
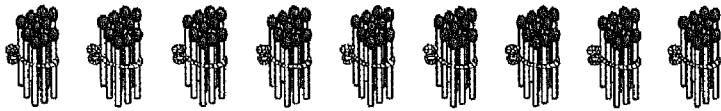
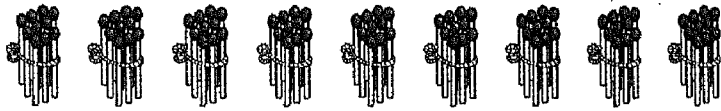
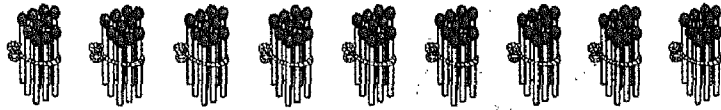
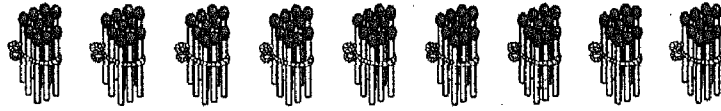
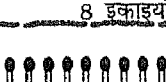
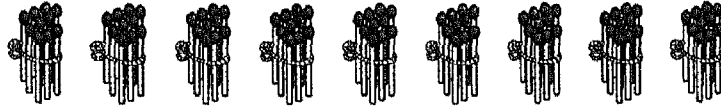
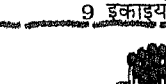
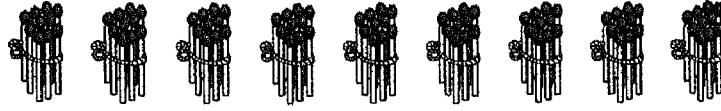
43

दहाइयाँ इकाइयाँ

दहाइयाँ	इकाइयाँ

22

खाली स्थान में संख्या लिखिए।

51 से 70 तक की संख्याएँ

खाली स्थान भरिए।

51
5 दहाइयाँ 1 इकाई

52
5 दहाइयाँ 2 इकाइयाँ

53
5 दहाइयाँ 3 इकाइयाँ

54
5 दहाइयाँ 4 इकाइयाँ

5 दहाइयाँ 5 इकाइयाँ

5 दहाइयाँ 6 इकाइयाँ

5 दहाइयाँ 7 इकाइयाँ

58
5 दहाइयाँ 8 इकाइयाँ

59
5 दहाइयाँ 9 इकाइयाँ

60
5 दहाइयाँ 1 दहाई

61
6 दहाइयाँ 1 इकाई

6 दहाइयाँ 2 इकाइयाँ

63
6 दहाइयाँ 3 इकाइयाँ

6 दहाइयाँ 4 इकाइयाँ

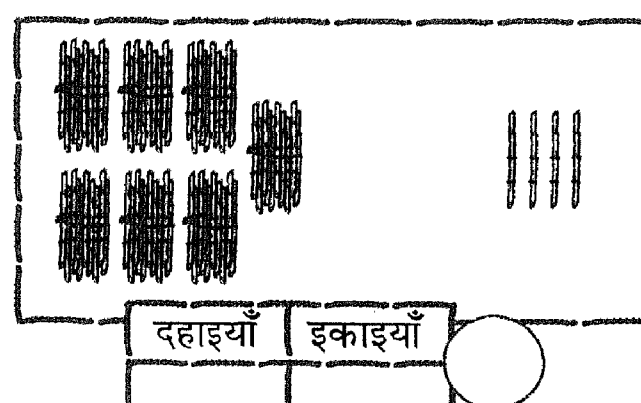
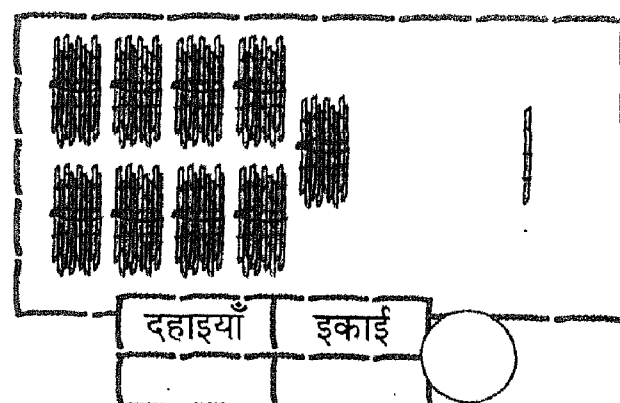
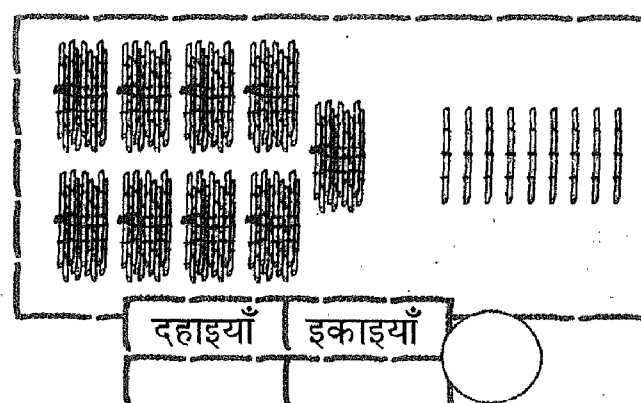
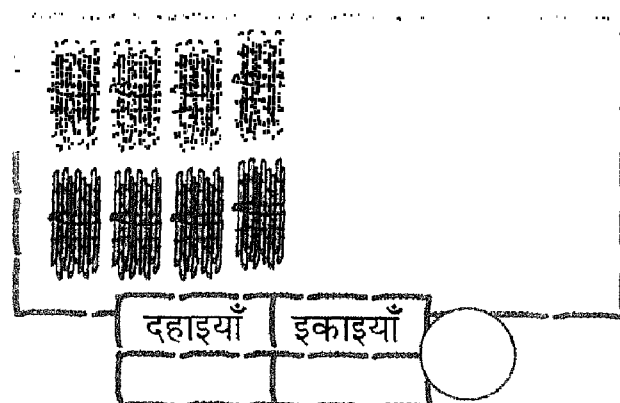
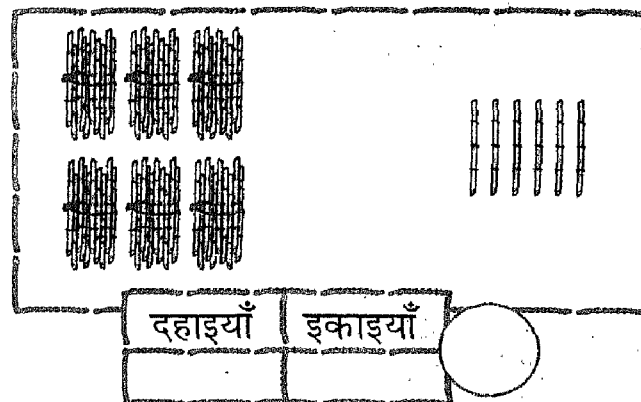
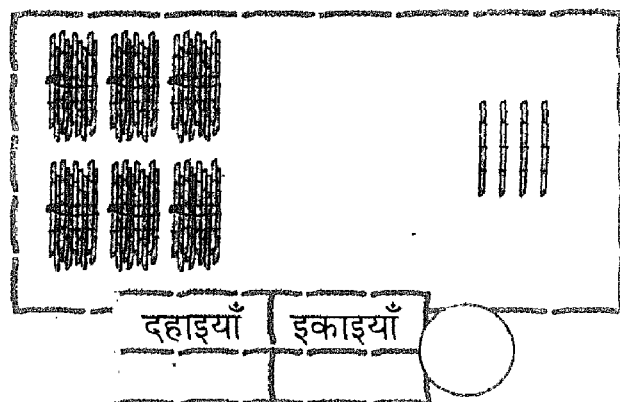
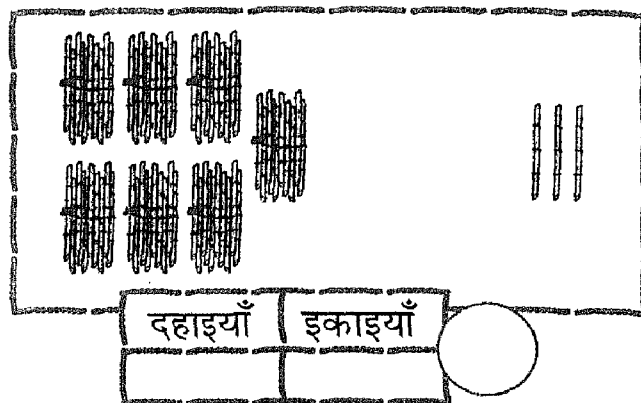
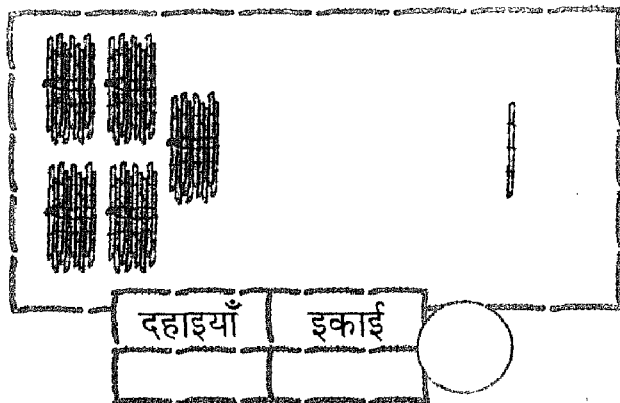
65
6 दहाइयाँ 5 इकाइयाँ

6 दहाइयाँ 6 इकाइयाँ

67
6 दहाइयाँ 7 इकाइयाँ

68
6 दहाइयाँ 8 इकाइयाँ

6 दहाइयाँ 9 इकाइयाँ

70
6 दहाइयाँ 1 दहाई

71 से 90 तक की संख्याएँ

खाली स्थान भरिए।

71
7 दहाइयाँ 1 इकाई

7 दहाइयाँ 2 इकाइयाँ

73
7 दहाइयाँ 3 इकाइयाँ

74
7 दहाइयाँ 4 इकाइयाँ

7 दहाइयाँ 5 इकाइयाँ

76
7 दहाइयाँ 6 इकाइयाँ

7 दहाइयाँ 7 इकाइयाँ

7 दहाइयाँ 8 इकाइयाँ

79
7 दहाइयाँ 9 इकाइयाँ

80
7 दहाइयाँ 1 दहाई

81
8 दहाइयाँ 1 इकाई

82
8 दहाइयाँ 2 इकाइयाँ

8 दहाइयाँ 3 इकाइयाँ

8 दहाइयाँ 4 इकाइयाँ

85
8 दहाइयाँ 5 इकाइयाँ

86
8 दहाइयाँ 6 इकाइयाँ

8 दहाइयाँ 7 इकाइयाँ

88
8 दहाइयाँ 8 इकाइयाँ

89
8 दहाइयाँ 9 इकाइयाँ

90
8 दहाइयाँ 1 दहाई

91 से 100 तक की संख्याएँ

खाली स्थान भरिए।

91
9 दहाइयाँ 1 इकाई

92
9 दहाइयाँ 2 इकाइयाँ

93
9 दहाइयाँ 3 इकाइयाँ

94
9 दहाइयाँ 4 इकाइयाँ

95
9 दहाइयाँ 5 इकाइयाँ

96
9 दहाइयाँ 6 इकाइयाँ

9 दहाइयाँ 7 इकाइयाँ

9 दहाइयाँ 8 इकाइयाँ

9 दहाइयाँ 9 इकाइयाँ

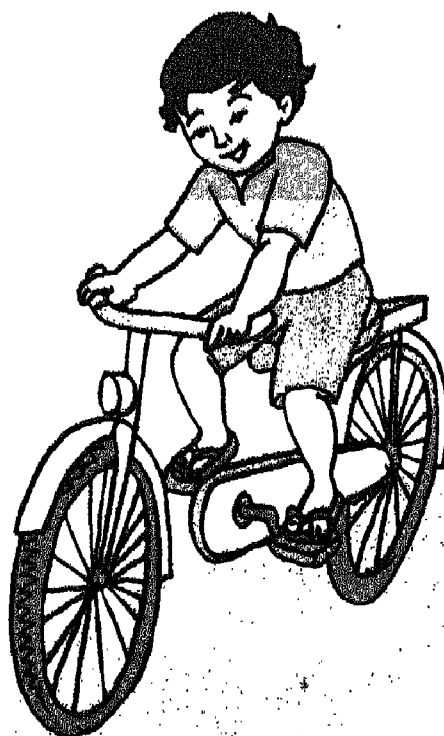
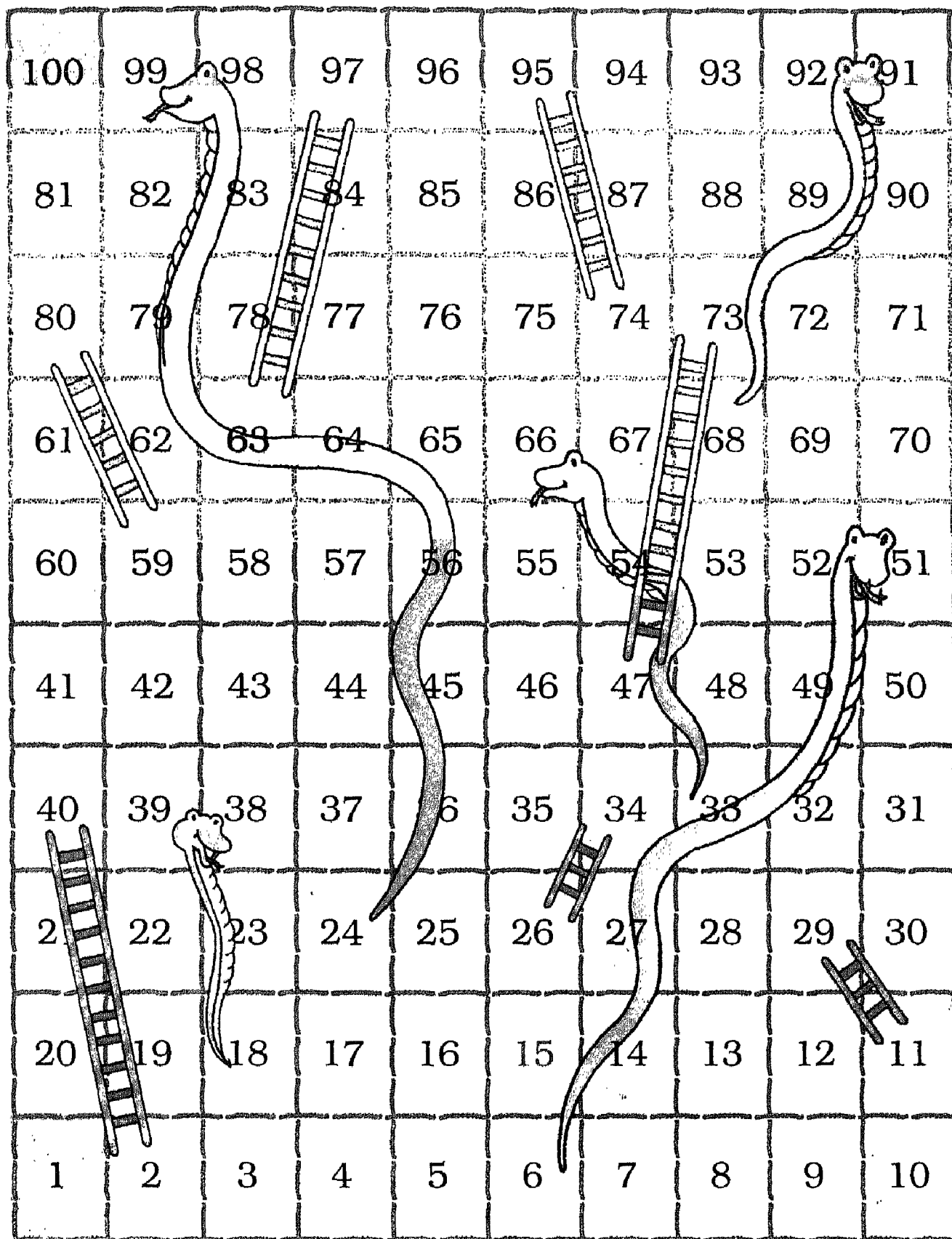
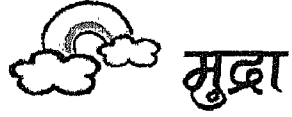
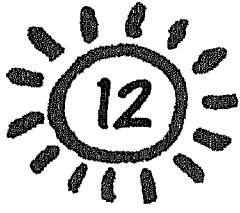
100
9 दहाइयाँ 1 दहाई

छूटी हुई संख्याओं को लिखिए।

51	52	53	54	55	56	57	58	59	60
	62			65				69	
		73							80
			84				88		
		93		95				99	

आओ साँप-सीढ़ी का खेल खेलें।

100	99	98	97	96	95	94	93	92	91
81	82	83	84	85	86	87	88	89	90
80	79	78	77	76	75	74	73	72	71
61	62	63	64	65	66	67	68	69	70
60	59	58	57	56	55	54	53	52	51
41	42	43	44	45	46	47	48	49	50
40	39	38	37	6	35	34	33	32	31
2	22	23	24	25	26	27	28	29	30
20	19	18	17	16	15	14	13	12	11
1	2	3	4	5	6	7	8	9	10

मुद्रा

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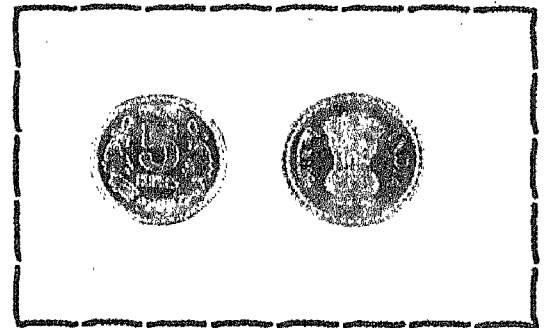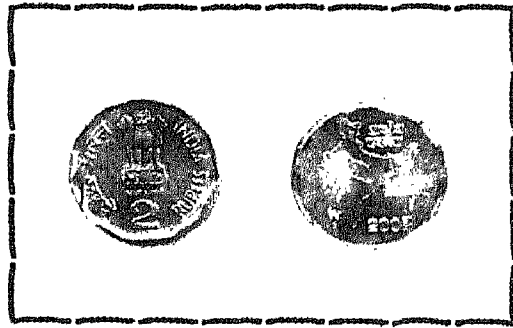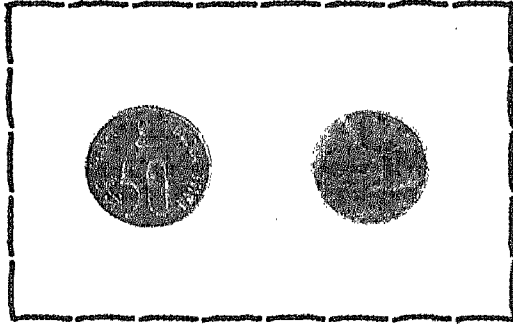
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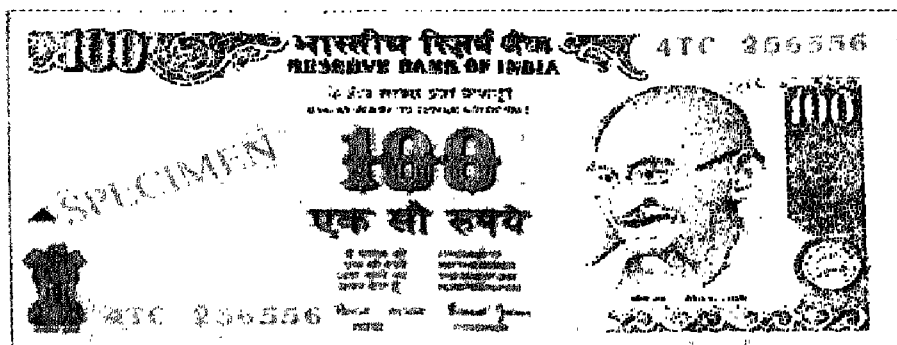
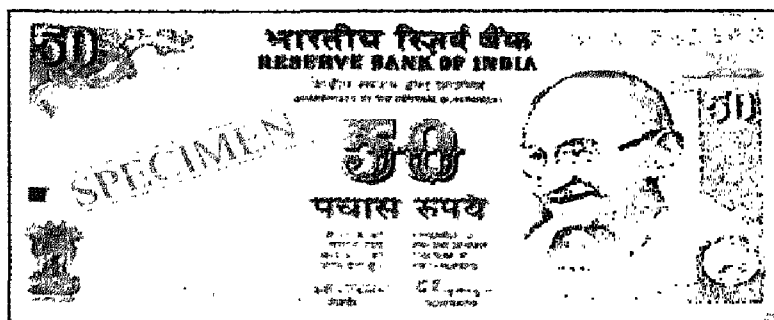
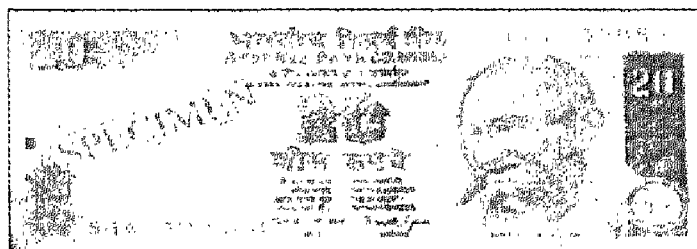
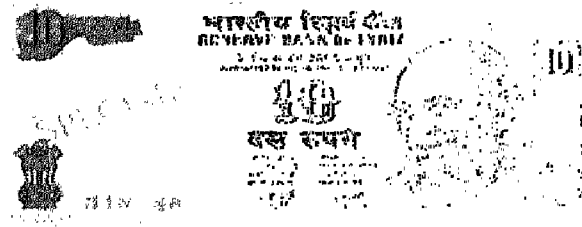
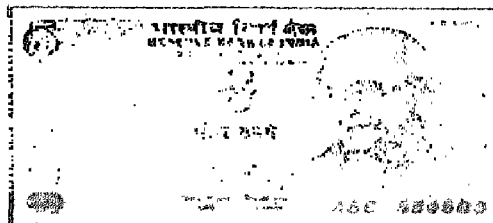

विभिन्न प्रकार के सिक्कों के जोड़ से निम्न राशि बनाइए।

विभिन्न प्रकार के सिक्कों के जोड़ से निम्न राशि बनाइए।

4 रुपये

4 रुपये

4 रुपये

5 रुपये

5 रुपये

5 रुपये

5 रुपये

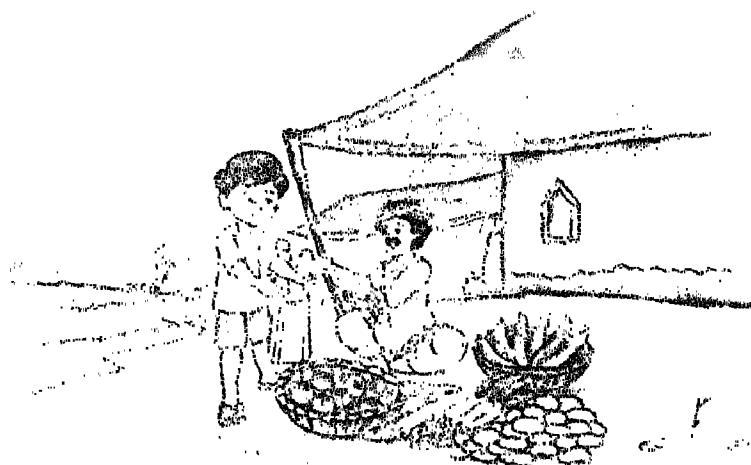
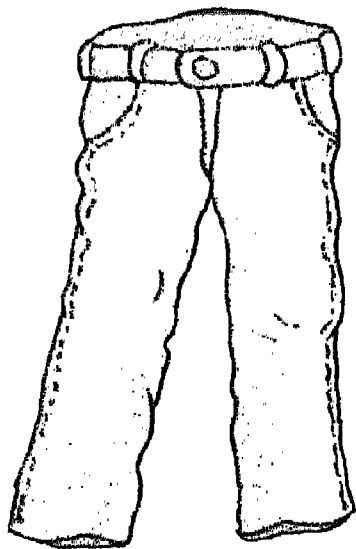
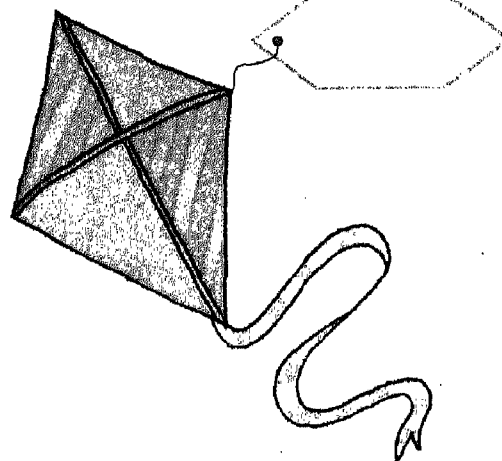
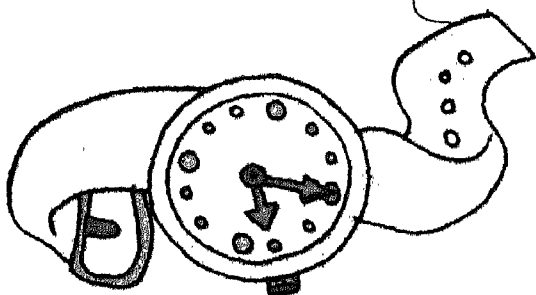
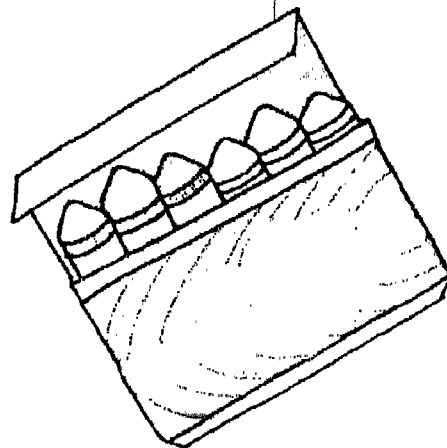
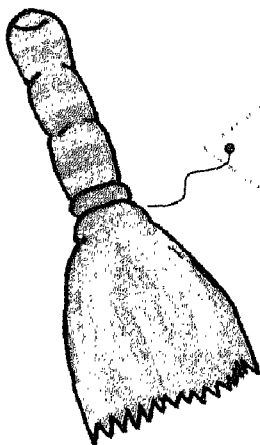
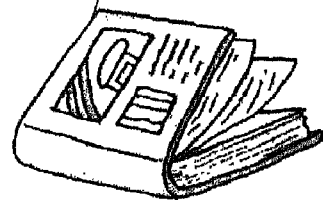
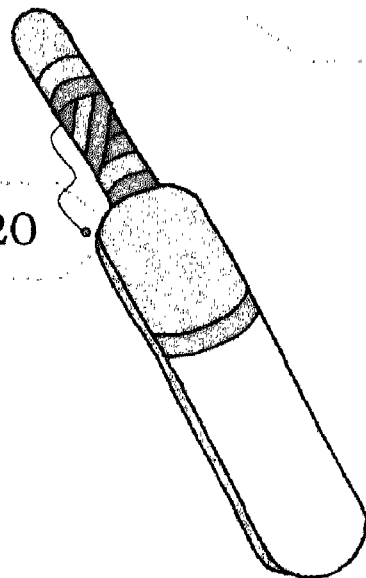
विभिन्न प्रकार के सिक्कों के जोड़ से निम्न राशि बनाइए।

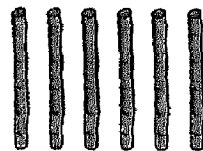
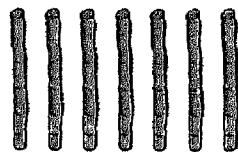
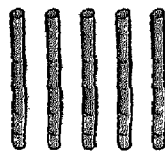
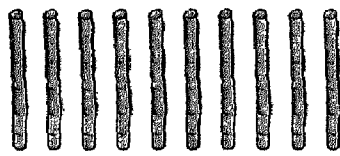
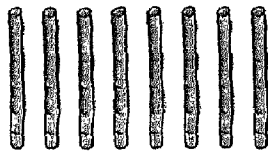
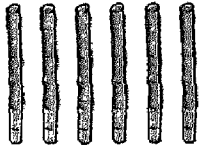
6 रुपये

6 रुपये

6 रुपये

6 रुपये

6 रुपये

अपने मित्र से चर्चा कीजिए और मूल्य का अनुमान लगाइए।

बताओ कितने

तीलियों की संख्या लिखिए।

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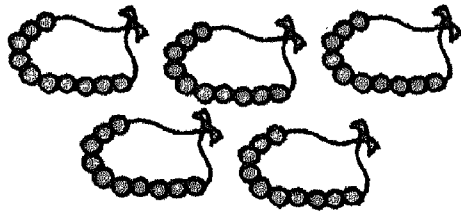
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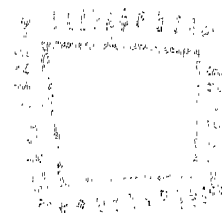
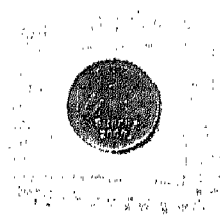
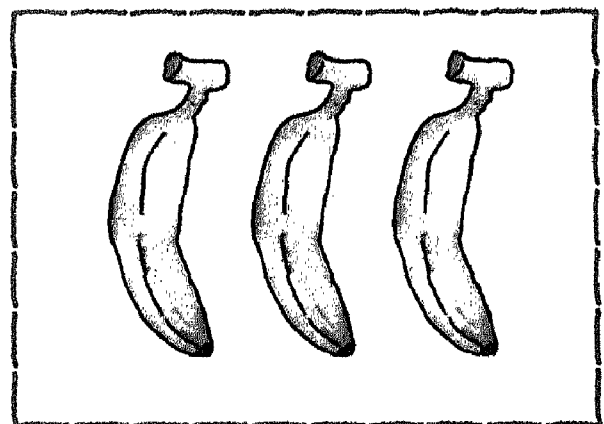
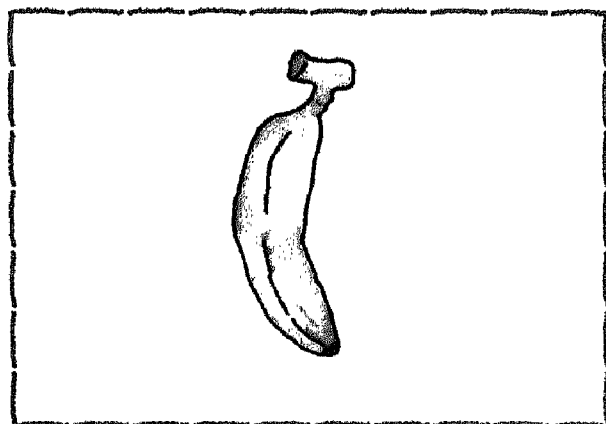
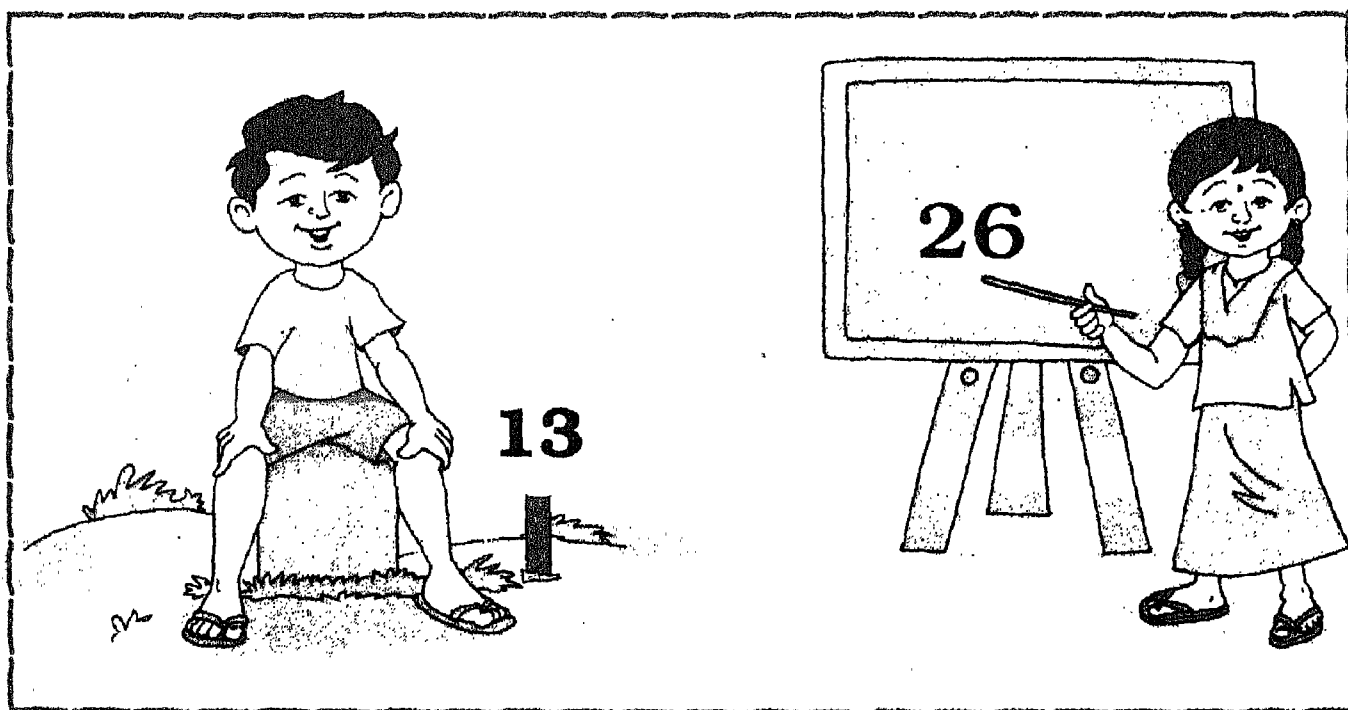
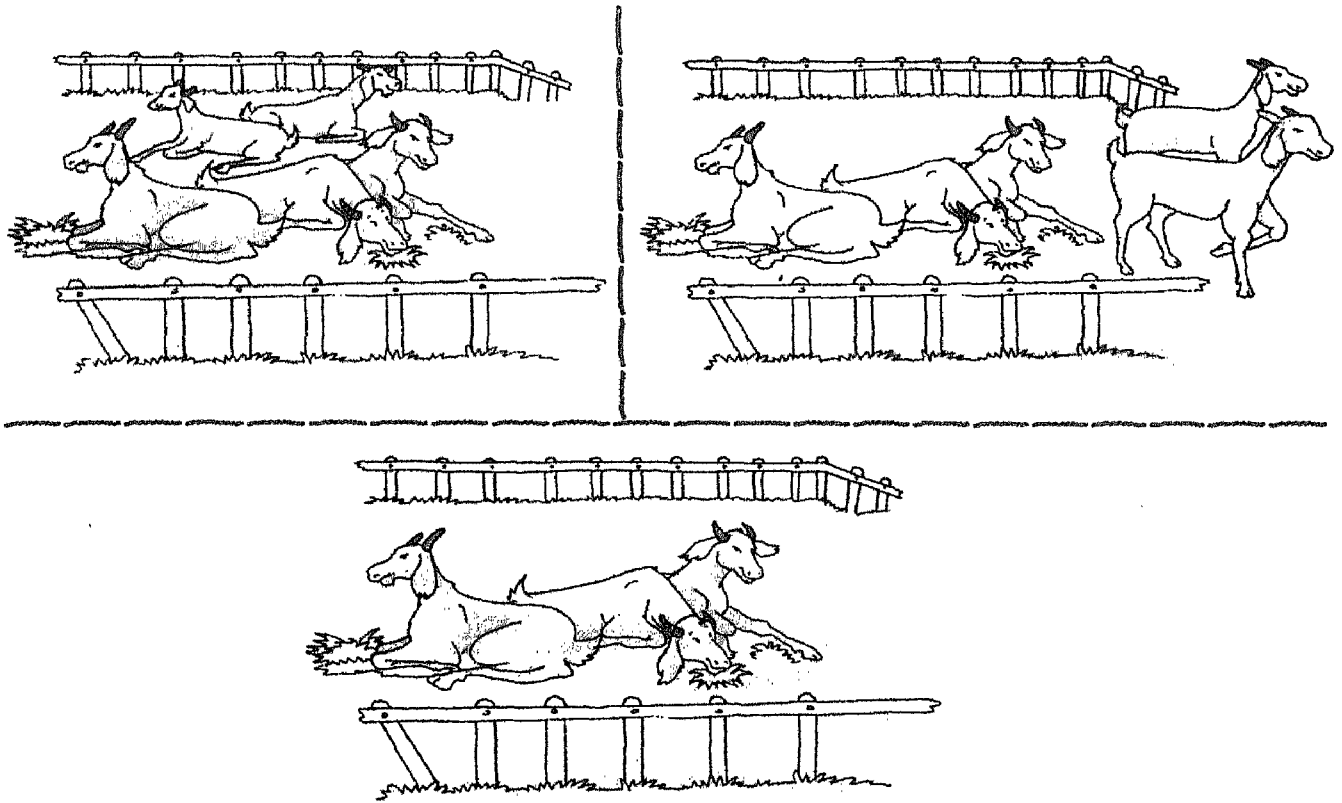

संख्या का नाम लिखिए।

कितनी दहाइयाँ?

कौन सी संख्या बड़ी है?

चित्रों की सहायता से कहानी बनाइए और कक्षा में सुनाइए।

बिल्लू

शिक्षकों के लिए टिप्पणी

भूमिका

राष्ट्रीय पाठ्यचर्या की रूपरेखा (2005) में माध्यमिक शिक्षा आयोग (1952) से ये पंक्तियाँ ली गई हैं – "किसी भी लोकतंत्र के नागरिक होने में बहुत सी बौद्धिक, सामाजिक और नैतिक विशेषताएँ शामिल हैं... लोकतांत्रिक समाज के किसी भी नागरिक के पास सच को झूठ से अलग करने, तथ्यों व कुप्रचार में फर्क करने और मतान्धता व पूर्वाग्रह के नकारात्मक प्रभावों को अस्वीकार करने की समझ और बौद्धिक संपूर्णता होनी चाहिए.... न तो वह पुराने को पुराना होने की वजह से अस्वीकार करे और न ही नए को नया होने की वजह से स्वीकार करे, बल्कि निष्पक्ष होकर दोनों की जाँच करे और साहसपूर्वक न्याय और प्रगति जैसी ताकतों के रास्ते में आने वाली अड़चनों को नकार सके..."। ये पंक्तियाँ लोकतंत्र के प्रति हमारी शिक्षा व्यवस्था की वचनबद्धता की पुष्टि करती हैं और साथ ही इसकी पुनरावृत्ति भी करती हैं कि लोकतंत्र के नागरिक अपने बारे में सोच सकें और सत्य को झूठ की जगह ला सकें। दूसरे शब्दों में कह सकते हैं कि शिक्षा को अन्य कई क्षमताओं के साथ-साथ बच्चों की स्वतन्त्र और आलोचनात्मक सोच विकसित करने में आवश्यक रूप से सहायता करनी चाहिए।

गणित संभवत: वह सबसे अच्छा माध्यम है जिसके द्वारा स्वतंत्र रूप से विचार करने, सच को जाँचने और उस पर टिके रहने की क्षमता का विकास होता है। गणित के जरिये हम दुनिया को आकृतियों, संख्याओं, मात्राओं और तर्कसंगत संबंधों द्वारा समझते हैं। हम दुनिया को अक्सर बिना गणित के भी अनुभव करते रहे हैं। लेकिन जब हम आकृतियों में समानता या एकरूपता पर गौर करने लगते हैं, संगीत की लय के प्रति अधिक संवेदनशील होने लगते हैं, वस्तुओं में कम या अधिक देखना शुरू करते हैं या ऐसी ही कुछ और चीजें करते हैं तब हम गणितीय के प्रति उत्सुक बनते जाते हैं। ज्ञान की जो शाखा या अनुशासन इन सबसे बनता है – स्थानिक रूप* और उनके संबंध, मात्रात्मक अवधारणाएँ और उनके संबंध और अमूर्त तार्किक संबंध, उसे गणित कहते हैं। गणित के अध्ययन से यह अपेक्षा की जाती है कि स्थानिक व परिमाणात्मक अवधारणाओं और उनके संबंधों की समझ बनेगी। इससे यह भी अपेक्षा की जाती है कि भाषा के सटीक इस्तेमाल, अंकन पद्धति और तर्क के प्रभावकारी प्रयोग जैसी क्षमताओं का विकास होगा। इस प्रकार, यह विषय लोकतंत्र के भावी नागरिकों को स्वतंत्र और आलोचनात्मक विचारक बनाने में सहायता करता है।

विभिन्न शैक्षिक उद्देश्यों को पूरा करने के लिए बनाई गई पाठ्यचर्या का अधिकतर हिस्सा हमारे आस-पास की दुनिया के ज्ञान से ही बनता है। पाठ्यचर्या में मौजूद विभिन्न विषयों को हम संसार को समझने का अलग-अलग तरीका मान सकते हैं। जिस तरह से गणित अपने आस-पास की दुनिया को स्थानिक, मात्रात्मक और तर्कसंगत संबंधों द्वारा समझता है, उसी तरह प्राकृतिक विज्ञान को एक ऐसा विषय मान सकते हैं जो कि प्राकृतिक संसार की समझ, उसकी भौतिक विशेषताओं और उसको जानने के तरीकों के आधार पर बनता है। भाषा एक ऐसी बुनियादी क्षमता है जिसके जरिये हम संकेतों या चिह्नों द्वारा संसार को समझते जाते हैं। इसी प्रकार, पाठ्यचर्या के अलग-अलग क्षेत्र दुनिया को अपने-अपने विशेष संदर्भ से समझते हैं। अत: गणित पूरे पाठ्यचर्या का एक महत्त्वपूर्ण हिस्सा है जिसे बच्चे धीरे-धीरे अपने अनुभवों, चिन्तन और अन्य लोगों जैसे कि अपने अध्यापक के साथ बातचीत के जरिए बनाते हैं।

बच्चों के अनुभव, उनके सोचने के तरीके और अवधारणाओं का निर्माण सभी एक संगठित व एकीकृत इकाई हैं। यह सभी मनोवैज्ञानिक दृष्टि से एकीकृत हैं क्योंकि इनमें तर्कसंगत सोच, मनोभाव तथा उद्देश्य और

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*अलग-अलग वस्तुओं और चीजों को स्थान, सजावट, विशेषता इत्यादि के क्रम में समझना।

शारीरिक क्रिया सभी शामिल हैं। ठीक उसी तरह जैसे दुनिया को स्थानिक और परिमाणात्मक संबंधों के जरिए समझना (गणित), सामाजिक वास्तविकता को मानवीय संबंधों के जरिए समझना (सामाजिक विज्ञान), पदार्थों की विशेषता, उनके प्राकृतिक वर्ग (प्राकृतिक विज्ञान) और उनका सौंदर्य, सही और गलत इत्यादि सभी एक संयुक्त रूप में और साथ-साथ महसूस किए जाते हैं। इस सबको यानि कि संसार को समझना और जानना केवल भाषा के जरिए ही संभव है। इसलिए, एक बच्चे के लिए पाठ्यचर्या के ये सभी विषय एक दूसरे के साथ परस्पर संबंध स्थापित किये हुए हैं और एक का विकास दूसरों पर प्रभाव डालता है और उससे प्रभावित भी होता है। किसी भी विषय को पढ़ाते समय हमें बच्चों के अनुभवों और सोच को किसी एक विषय वस्तु तक ही सीमित नहीं करना चाहिए। गणित का शिक्षण तभी बेहतर हो सकता है यदि अध्यापक साथियों के साथ गणितीय संबंधों और अवधारणाओं के बारे में भी बातचीत करें। यदि बच्चों को प्रश्न पूछने के लिए प्रेरित किया जाए और उनकी असहमतियों और उलझनों को अभिव्यक्त करने दिया जाए तभी वे बेहतर ढंग से सीख सकेंगे। केवल अंकों और गणितीय पहलुओं पर सीमित न करते हुए, उन्हें वस्तुओं के प्राकृतिक व अन्य पहलुओं को जाँचने और उन पर चर्चा करने दिया जाए।

इन पुस्तकों के जरिए सबसे बेहतर ढंग से पढ़ाने का तरीका यही होगा कि सबसे पहले बच्चों को इससे संबंधित अनुभव प्रदान किये जाएँ, फिर उनके बारे में सरल भाषा में बातचीत की जाए जिससे बच्चा उस अनुभव को समझ सके, और फिर अधिक औपचारिक और अमूर्त गणितीय अवधारणाओं और संबंधों तक पहुँच सके। यदि परिभाषा बतानी ही हो तो वह सबसे अंत में बताएँ। इस किताब में आप बार-बार देखेंगे कि प्रत्येक विषय से पहले बच्चों को कुछ नयी समस्याएँ या प्रश्न दिए गए हैं जिन्हें स्वयं हल करने की प्रक्रिया में बच्चों में नयी अवधारणाओं का विकास होता जाता है। जब ये अवधारणाएँ फिर संघटित और औपचारिक होकर एक निश्चित रूप ले लेती हैं तब ये गणितीय अवधारणाएँ बन जाती हैं।

ऊपर लिखी बातों का सार इस प्रकार है :

(क) बहुत सी अन्य क्षमताओं के साथ-साथ गणित शिक्षण का मुख्य उद्देश्य है बच्चों को स्वतंत्र और आलोचनात्मक विचारक बनने में सहायता करना।

(ख) गणित सिर्फ आकृतियों या संख्याओं तक सीमित नहीं है बल्कि सोचने और समझने का एक तरीका है।

(ग) यह बच्चों के अनुभवों और ज्ञान का अभिन्न अंग है और इसलिए पूरी पाठ्यचर्या के साथ इसका संबंध बनाए रखना बहुत जरूरी है।

(घ) बच्चों के अनुभव, चर्चाएँ और खोज-बीन गणितीय ज्ञान के सृजन का मूलाधार है इसलिए तरह-तरह के क्रियाकलापों के अधिक से अधिक अवसर कक्षा में दिए जाने चाहिए।

(ङ) बच्चों द्वारा की जाने वाली अशुद्धियाँ उनके सीखने और ज्ञान हासिल करने की प्रक्रिया के भाग हैं। इन अशुद्धियों से उनके सोचने के ढंग को समझने में सहायता लेनी चाहिए न कि इन्हें 'समस्या' समझना चाहिए।

(च) गणित शिक्षण में परिभाषा सबसे अंत में देनी चाहिए (यदि देनी भी हो तो), जब अध्याय को सूत्रबद्ध तरीके से समेटा जा रहा हो, ना कि शुरुआत में।

इस पुस्तक का बेहतर ढंग से उपयोग करने के लिए गतिविधियों के क्रम को लेकर कुछ सुझाव :

(क) इससे पहले कि बच्चे पुस्तक के किसी भी पृष्ठ पर काम करना शुरू करें उससे जुड़े हुए विषयों/अवधारणाओं की जानकारी उन्हें किसी क्रियाकलाप/खेल/कहानी/चर्चा द्वारा दी जाए।

(ख) अवधारणाओं/विचारों को संघटित करने के लिए, पूरी कक्षा को ध्यान में रखकर ब्लैकबोर्ड पर अभ्यास कराया जाए।

(ग) पुस्तक के जिस पृष्ठ पर काम किया जाना हो उसके बारे में चर्चा कीजिए, चित्रों के बारे में बातचीत कीजिए, क्या करना है उस पर दिए चिह्नों का क्या मतलब है आदि, इसके बाद बच्चों को स्वयं अपने आप पुस्तक में काम करने दें।

(घ) पुस्तक में काम करते समय भी बच्चों को आपस में चर्चा करने का अवसर अवश्य दें।

(ङ) बच्चों का काम प्रतिदिन देखें और उसकी जाँच करें।

(च) बच्चों ने कुछ 'अशुद्धियाँ' की हैं तो उन्हें काटने या गलत करने या 'सही' उत्तर लिखने के बजाए, उस उत्तर के पीछे छिपे बच्चे के तर्क को समझने की कोशिश कीजिए।

(छ) बच्चों को कुछ अन्य अभ्यास/क्रियाकलाप भी दिए जाएँ जिसे वह अपनी समझ व अनुभव के अनुसार कर सकें और फिर वहाँ से वह उस गणितीय समझ की ओर बढ़े जैसा कि आप चाहते हैं।

अध्याय 1–7, 9–10 और 12 के लिए शिक्षक-टिप्पणी को विस्तार में दिया गया है। चूँकि अध्याय 8, 11 और 13 के लिए विषय निर्देशों की जरूरत नहीं है इसलिए शिक्षक ठीक उसी तरह के क्रियाकलाप करा सकते है जैसा कि अन्य अध्यायों के लिए दिया गया है।

आकृतियाँ और स्थान

हमारे आस-पास की दुनिया, जिसे हम लगातार अनुभव करते हैं, वह बहुत ही अस्पष्ट और धुँधली सी हो जाएगी यदि हम उसे बिना आकृतियों और स्थानिक संबंधों में स्वयं संगठित करते हुए न चलें। आकृतियों और स्थानिक संबंधों के कारण ही हम अलग-अलग वस्तुओं को देख पाते हैं और उनकी विभिन्न विशेषताओं को भी समझ पाते हैं। अनुभवों को इस तरह से समझने की क्षमता को ही स्थानिक समझ कहते हैं। जो बच्चे इन स्थानिक संबंधों की अच्छी समझ बना लेते हैं वे संख्याओं को, मापन को, आंकड़ों को और अमूर्त गणितीय समझ को बेहतर तरीके से सीख पाते हैं। इसलिए इन सभी अवधारणाओं के विकास में शुरुआती चरण से ही अधिक ध्यान देने की आवश्यकता है। यही इस पुस्तक के पहले अध्याय का लक्ष्य भी है।

एक अच्छा अध्यापक किसी भी पुस्तक का उपयोग करने के लिए अपने तरीके निकाल ही लेता है। इस पुस्तक के साथ भी ऐसा ही है। इसे उपयोग करने का एक प्रभावशाली ढंग नीचे दिया गया है। यहाँ दिए गए बहुत से सुझाव सामान्य हैं और सभी अध्यायों में काम आएँगे। इन सुझावों को आगे के अध्यायों में टिप्पणी की तरह नहीं दोहराया जाएगा।

योजना बनाना और तैयारी करना

कक्षा में जाने से पहले बनाई गई योजना और की गई तैयारी बहुत ही सहायक सिद्ध होती है। इससे बच्चे और अध्यापक दोनों को ही कक्षा में आनंद आता है और बच्चों को भी सीखने में सहायता मिलती है।

1. योजना बनाते समय अध्याय की विषय-वस्तु की सूची बना लीजिए। यहाँ विषय-वस्तु से अभिप्राय है अध्याय में प्रयोग हुई सभी अवधारणाएँ, विचार, कौशल, सिद्धांत आदि। अध्याय एक की विषय-वस्तु बॉक्स में दी गई है।

2. पुस्तक में काम शुरू करने से पहले कुछ ऐसे खेल या क्रियाकलाप बनाए जाएँ जिन्हें बच्चे कक्षा में या खेल के मैदान में करें जहाँ बच्चे वस्तुओं का तीन-आयामी आकृतियों के रूप में प्रयोग करें और उन्हें अवधारणाओं से जुड़े शब्दों का प्रयोग करने का अवसर मिले जो अध्याय की विषय-वस्तु में शामिल है। इन अवधारणाओं का उपयोग कुछ माँगने (कृपया, मुझे इससे बड़ी गेंद पकड़ा दें), प्रश्न करने, या सामान्य बातचीत के रूप में किया जा सकता है। जब बच्चे इन शब्दों को बेझिझक और समझ के साथ प्रयोग करना सीख जाएँ तभी पुस्तक का उपयोग किया जाए।

सीखने के लिए विषय वस्तु

अवधारणाएँ	:	अंदर-बाहर, बड़ा-छोटा, सबसे बड़ा - सबसे छोटा, ऊपर-नीचे, पास-दूर, सबसे पास - सबसे दूर, ऊपर-नीचे, के ऊपर, के नीचे।
तीन-आयामी आकृतियाँ	:	गोलाकार, बेलनाकार, घनाभ और शंकु की आकृति को देखकर पहचानना। लुढ़कना और सरकना की समझ।
दो-आयम वाली आकृतियाँ	:	वृत्त, वर्ग, आयत और त्रिभुज को देखकर पहचानना।

3. अध्याय एक की शुरुआत अरब और उसके ऊँट की कहानी पढ़कर हो सकती है। कहानी पढ़ते समय बच्चों को चित्र देखने के लिए कहें और कोशिश करें कि जब आप पढ़ रहे हों तो वे उसको सुने और समझें। ध्यान रखें कि, आप तो कहानी को पढ़ रहे हैं, पर बच्चे तो केवल उसे सुनकर और अपने अनुमान से समझ रहे हैं। उनसे यह अपेक्षा न करें कि वे अपने आप से कहानी पढ़ेंगे। कहानी पढ़ने के बाद, अंदर-बाहर के बारे में बातचीत कीजिए। कुछ अन्य परिस्थितियाँ भी बनाई जाएँ जहाँ इन शब्दों का प्रयोग होता हो।
4. पृष्ठ 3 से 7 के लिए एक संदर्भ बनाया जाए, उनसे मिलती-जुलती गतिविधियाँ ब्लैकबोर्ड पर करवाई जाएँ, और फिर बच्चों को स्वयं पुस्तक में काम करने दिया जाए। यदि बच्चे चाहें तो उन्हें चर्चा करने दी जाए। उनकी आपसी बातचीत को प्रोत्साहित किया जाए।
5. पृष्ठ 8 और 9 बातचीत के लिए हैं। उदाहरण के रूप में, बच्चों को पृष्ठ 8 खोलने के लिए कहें और फिर उनका ध्यान चित्रों में मौजूद भिन्न-भिन्न लोगों और वस्तुओं की ओर दिलवाएँ। मेज पर कितने बच्चे हैं? मेज के नीचे कितने हैं? क्या स्टूल पर भी कोई है? आदि। बच्चों को भी ऐसे ही प्रश्न पूछने के अवसर दिए जाएँ। यह एक बहुत ही रोचक अनुभव रहेगा यदि आप कक्षा के आधे बच्चों को लेकर पृष्ठ 8 पर दिए गए चित्र जैसी परिस्थिति कक्षा में बनाएँ और शेष आधे बच्चों से सभी संबंधित अवधारणाओं को लेकर उसके बारे में बातचीत करें।
6. जब तीन-आयामी आकृतियों के बारे में सिखाना हो तो परिवेश में उपलब्ध अलग-अलग आकारों की वस्तुओं को इकट्ठा किया जाए; जैसे - माचिस की तीलियाँ, मनके संगमरमर के टुकड़े, बोतलें, ढक्कन, बटन, खाली माचिस की डिब्बियाँ, कीप, चूड़ियाँ आदि। बच्चों को प्रोत्साहित किया जाए कि वे जिस भी तरह से चाहें वस्तुओं को छाँटें। बच्चों के साथ चर्चा के दौरान उन्हें प्रोत्साहित किया जाए कि उन्होंने जो किया है वह क्यों किया है इसे वे समझा सकें। कुछ इस तरह के प्रश्न करें जैसे कि -
   - ये वस्तुओं एक साथ क्यों होती हैं?
   - यह वस्तु इस समूह का भाग क्यों है?
   - क्या आप इन वस्तुओं को किसी और प्रकार से छाँट सकते हैं? आदि।

7. पिछले क्रियाकलाप के दौरान संग्रह की गई वस्तुओं में से गेंद या संगमरमर के टुकड़े को तिरछी सतह पर रखकर देखें और बच्चों को ध्यान से देखने को कहें कि ये वस्तुएँ तिरछी सतह पर कैसे सरकती हैं। बच्चे से कहें कि वे इन वस्तुओं को तिरछी सतह पर सरकने के आधार पर छाँटें। उन्हें ऐसे ही लुढ़कने और सरकने वाली कुछ और वस्तुओं के नाम बताने को कहें।
8. किसी भी एक बच्चे की आँखों पर पट्टी बाँध दें और उसे कोई भी एक वस्तु पकड़ा दें। बच्चे को उसे छूने और महसूस करने दिया जाए ताकि वह अनुमान लगा सके कि यह लुढ़केगी या सरकेगी।
9. पृष्ठ 13 और 14 पर दी गई कहानी बच्चों को सुनाएँ और उन्हें उसके बारे में बात करने दें। आप चित्रों के बारे में इस तरह से बातचीत शुरू कर सकते हैं, जैसे इस चित्र में क्या दिखाया गया है? इसमें क्या हो रहा है? ये प्रश्न भी पूछे जा सकते हैं कि ढोलक कैसे लुढ़कती चली जा रही थी? उसे मेमने की झोपड़ी तक जाने का रास्ता कैसे पता चला था? क्या मेमना अंदर से लुढ़कता चला आ रहा था? ये प्रश्न सही उत्तर तक पहुँचने का तरीका तो नहीं हैं लेकिन अलग-अलग स्थितियों को सोचने का जरिया जरूर हैं।
10. आकृतियों के कुछ पृष्ठ इस पुस्तक के पीछे दिए गए हैं। बच्चों को प्रत्येक आकृति को काटकर एक आकृति-किट तैयार करने को कहें। अब उन्हें इन आकृतियों की सहायता से चित्र बनाने को कहें।
11. बच्चों को आकृति-किट में से आकृति को छाँटने के लिए कहें और फिर वे एक जैसी आकृतियों को मिलाएँ।

एक से नौ तक की संख्याएँ

जब बच्चे स्कूल में आते हैं तो उन्हें अंकों और मौखिक गिनती का कुछ अनुभव तो होता ही है। लेकिन हो सकता है कि इन संख्याओं का प्रयोग करने में उनको आत्म-विश्वास न हो। गिनती की प्रक्रिया का परिचय देते समय यह जरूर ध्यान दें कि ये क्रमानुसार और सुव्यवस्थित रूप से हो जो कि बच्चों में अंक प्रणाली की समझ का विकास करे। गिनती का मूल आधार यही है कि चीजों के एक निश्चित समूह का एक-से-एक करके मेल, संख्याएँ और उनके नाम के क्रमवार समूह से हों। इस विचार का रोज की परिस्थितियों में कुशलतापूर्वक उपयोग करने के लिए जरूरी है कि बच्चे समान या एक जैसी चीजों का मिलान करें, चीजों को छाँटे और उनका वर्गीकरण करें, और समूहों को किसी विशिष्ट तरह से क्रमबद्ध करें। कक्षा में कुछ गतिविधियाँ जैसे मिलान करना, छाँटना, वर्गीकरण करना, और चीजों को क्रम देना बहुत ही उपयोगी है? इस पाठ के संदर्भ में हम यह कह सकते हैं कि एक बच्ची (या बच्चा) गिनना जानती है अगर वह :

(क) संख्या के नाम को सही क्रम में बोल सके।

(ख) किसी समूह में मौजूद वस्तुओं की सही संख्या बता सके जैसे कि मेरे हाथ में कितनी पेंसिलें हैं?

(ग) एक समूह में से बताई गई संख्या के बराबर वस्तुएँ उठा सके जैसे "मुझे 7 संगमरमर के टुकड़े दो"।

इस तरह से गिनना तभी मुमकिन है जब बच्चा संख्याओं को क्रम में याद रखने के साथ-साथ:

(i) गिनते समय प्रत्येक वस्तु को एक और केवल एक ही संख्या दे।

(ii) समझे कि गिनते समय वस्तुओं का क्रम मायने नहीं रखता।

(iii) वे यह भी समझे कि गिनते समय बोली गई आखिरी संख्या समूह में कुल कितनी वस्तुएँ हैं यह बताती है।

इन सभी योग्यताओं को पाने के लिए अध्यापक नीचे दी गई गतिविधियों को करें :

1. बच्चे के सामने दो समूहों को रखें और उससे एक समूह की वस्तुओं को दूसरे समूह की वस्तुओं के साथ मिलान करने को कहें (जिन वस्तुओं का मिलान हो जरूरी नहीं है कि उनका कोई गुण एक जैसा ही हो)। उनसे प्रश्न पूछें जैसे – "किस समूह में सबसे ज्यादा वस्तुएँ हैं" "किसमें कम"? "किन वस्तुओं का दूसरे समूह से कोई संगत नहीं है?"

2. बच्चों को कुछ बोतलों और उन बोतलों के ढक्कनों का एक समूह दीजिए। उन्हें प्रत्येक बोतल पर ढक्कन लगाने को कहें। यह गतिविधि काफी सारी अन्य वस्तुओं के साथ भी की जा सकती है। जैसे :

   (क) प्रत्येक प्लेट पर एक कप रखिए।

   (ख) प्रत्येक पत्ते पर एक कंकड़ रखिए।

   (ग) प्रत्येक कॉपी पर एक पेंसिल रखिए आदि।

   इन समस्त क्रियाकलापों में निम्नलिखित शब्दावली विकसित की जा सकती है:

   अधिक, कम, उतने ही जितने कि, बराबर संख्या वाले

3. कुछ मनके/संगमरमर के टुकड़े/चॉक लीजिए। इन्हें बच्चों के सामने रखिए और ऊँचे स्वर में गिनिए।

   एक, दो, तीन, चार, ... नौ।

जब आप बोल कर गिनें, बच्चों को उन शब्दों को दोहराने के लिए कहें और प्रत्येक वस्तु की तरफ इशारा करके गिनें।

बच्चों को कुछ उँगलियाँ दिखाएँ और उन्हें गिनने को कहें और फिर उतनी ही बार ताली बजाने/कूदने के लिए कहें। बच्चों को उतनी उँगलियाँ दिखाने के लिए कहें जितनी बार आप ताली बजाते हैं। बच्चों का छोटे-छोटे पत्थर या कोई और आसानी से मिलने वाली वस्तुएँ जो सुरक्षित हों, एकत्रित करने को कहें। इन्हें वे गिनें और एक दूसरे से प्रश्न पूछें "यह कितने हैं?", "मुझे पाँच बोतल के ढक्कन दीजिए" आदि।

4. बच्चों को अपने शरीर के अंगों को (जैसे आँख, नाक, उँगलियाँ, कान आदि) या कुछ अन्य आसपास की वस्तुओं को गिनने के लिए कहें; जैसे – कक्षा में मौजूद वस्तुएँ, घर के सदस्य, स्कूल में लगे पेड़ आदि।

5. कुछ चॉक के टुकड़े एक हाथ में पकड़िए; उन्हें एक-एक करके मेज पर रखिए और बच्चों से गिनने के लिए कहिए : "एक; दो; तीन; चार; पाँच; छह; सात; आठ; नौ"।

   याद रखें कि इससे पहले कि बच्चे 1 से 9 तक के अंकों को पढ़ने या लिखने की कोशिश करें, उन्हें 9 तक गिनने का आत्मविश्वास हो जाना चाहिए।

6. पृष्ठ 22 और 23 पर दी गई तुकबंदियाँ खूब सारी गतिविधियों में इस्तेमाल की जा सकती हैं जैसे कि अध्यापक के साथ मिलकर बच्चे कविता गाएँ या कक्षा के सामने सहज अभिनय करें।

7. पृष्ठ 27 पर काम करने से पहले अंकों का परिचय देने के लिए अंक-कार्ड का प्रयोग करें। चार बच्चों के समूह को 9 कार्डों का एक सेट दिया जा सकता है। हर कार्ड के एक तरफ 1 से 9 तक का कोई अंक लिखा हो और दूसरी तरफ उतने ही बिंदु लगे हों। क्योंकि बच्चे गिन सकते हैं इसलिए कार्ड के पीछे के बिंदु उन्हें कार्ड पर लिखे अंक को पढ़ने और समझने में मदद कर सकते हैं। बच्चे एक दूसरे से अंक पढ़ने को कहें और फिर बिन्दु गिनकर उसकी जाँच करें, इससे उनको इसका अभ्यास हो जाएगा। पुस्तक के पृष्ठ पर काम करना

तभी शुरू करें जब बच्चों को अंकों को पढ़ने का आत्मविश्वास आ जाए। तब भी बच्चों को कार्ड का इस्तेमाल पृष्ठ 27 से 33 पर काम करते समय करने दें।

8. शून्य का परिचय देने के लिए, कुछ वस्तुएँ (पाँच तक) मेज पर इकट्ठी करें। बच्चों से पूछें कि यह कितनी हैं। एक वस्तु निकालें और कहें ''एक बाहर चली गई'' या कुछ और ऐसा ही करें और पूछें ''अब कितनी बचीं?'' जब आखिरी वस्तु भी बाहर निकाल दी जाए, तब हो सकता है कि कक्षा का कोई बच्चा कहे ''जीरो'' या ''शून्य'' और अधिकतर कहेंगे ''कुछ भी नहीं।'' यहाँ पर आप शून्य का परिचय एक अंक की तरह दे सकते हैं, जिसका मतलब है कि संग्रह की गई वस्तुओं में कुछ नहीं है। उदाहरण के रूप में जैसे कहें कि ''मेज पर शून्य पैन''। बच्चों को यह गतिविधि छोटे समूह में करने को कहें। जब बच्चों की ''शून्य'' की समझ बनने लगे, तो संख्या कार्ड के समूह में एक और कार्ड भी शामिल कर लें जिसमें एक तरफ शून्य लिखा हो और दूसरी ओर कार्ड खाली छोड़ दें।

जोड़

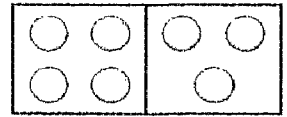
जोड़ की अवधारणा से हमारा अभिप्राय दो समूहों की वस्तुओं को 'मिलाकर गिनने' से है, इससे समूहों में वस्तुओं की संख्या पर ध्यान केंद्रित होता है। जोड़ का ज्ञान देने से पहले बच्चों को समूहों के मिलाने का पर्याप्त अनुभव देना होगा। बच्चों को विभिन्न वस्तुओं के उपयोग करने हेतु पर्याप्त अवसर देने होंगे। शुरु में 'एक और' विचार सुझाएँ और उसे प्रायः दोहराते रहें।

इस अवधारणा का विकास तीन चरणों में होता है:

1. दोनों समूहों की वस्तुओं को अलग-अलग गिनना, समूहों को मिलाना, मिलाए गए समूहों की वस्तुओं को गिनना।
2. एक समूह की वस्तुओं को गिनना और फिर इस संख्या से आगे दूसरे समूह की वस्तुओं को गिनना तथा इसी प्रकार आगे बढ़ना।
3. समूहों की वस्तुओं के प्रयोग किए बिना, समूहों की वस्तुओं की संख्याओं का उपयोग करना।

गतिविधियाँ

1. कुछ वस्तुएँ जैसे पत्ते, कंकड़ या बीज इत्यादि इकट्ठा करें। उन्हें दो अलग-अलग समूहों में रखें और फिर एक बच्चे से पूछें कि दोनों समूहों में कुल कितनी वस्तुएँ हैं।
2. भिन्न संख्या वाली वस्तुओं (एक ही प्रकार की) के चित्रों के दो कार्ड लें। छात्रों से पूछें कि दोनों कार्डों में कुल मिलाकर कितनी वस्तुएँ हैं।
3. एक बच्चे को ब्लैकबोर्ड के निकट बुलाएँ और तीन त्रिभुज बनाने को कहें। अन्य बच्चे से दो त्रिभुज बनवाएँ। तीसरे बच्चे से पूछें कि ब्लैकबोर्ड पर कुल कितने त्रिभुज बने हैं।

4. एक डोमिनो 4 – 3 लीजिए। एक बच्चे से इसके दोनों भागों पर बने छेदों को गिनने को कहिए। फिर किसी दूसरे बच्चे से डोमिनो पर कुल मिलाकर कितने छेद हैं, बताने को कहिए।

5. पृष्ठ 60 पर दी गई गतिविधि के बहुत सारे सही उत्तर हो सकते हैं। ठोस वस्तुओं का प्रयोग करके, किसी भी अंक को लेकर, जैसे कि 5, को जितने तरीके से हो सकता है बनाएँ। फिर बच्चों को अलग-अलग तरीकों से अलग-अलग अंक बनाने को कहें। ब्लैकबोर्ड पर एक अंक लिखें जैसे कि 7, और एक बच्चे से एक उत्तर देने को कहें। फिर दूसरे बच्चों को और उत्तर देने को कहें, जब तक कि सभी उत्तरों की सूची बोर्ड पर न बन जाए।

जोड़ का क्रम-विनिमेय का गुण –

बच्चों को जोड़ का क्रम-विनिमेय का गुण सिखाने के लिए ठोस वस्तुओं का प्रयोग किजिए और फिर डोमिनो की मदद लीजिए। इस प्रकार से प्रश्न पूछिए –

4 पेंसिलें और 2 पेंसिलें हैं तो दोनों मिलाकर कुल कितनी पेंसिलें हुईं?

2 पेंसिलें और 4 पेन्सिलें है तो अब कुल मिलाकर कितनी पेंसिलें हुईं?

इसी प्रकार के अनेक उदाहरण दिये जाएँ जिनसे बच्चे जोड़ के क्रम-विनिमेय के गुण को अच्छी प्रकार से समझ सकें। 'क्रम-विनिमेय' शब्द का परिचय बच्चों को देने की जरूरत नहीं है, उन्हें केवल यही समझ देनी है कि अगर कोई पहले 2 वस्तु ले और फिर 4 ले अथवा पहले 4 ले और फिर 2 ले तो उत्तर एकसमान रहता है।

जोड़ में शून्य

एक बर्तन लीजिए और उसमें कुछ वस्तुएँ रखिए। बच्चों से रखी गई वस्तुओं को गिनने को कहें। अब इसमें 3 और वस्तुएँ रखिए तथा बच्चों को बताने दीजिए कि इसमें 3 वस्तुएँ और रखी गई हैं। अब उनसे सब वस्तुओं को गिनवाइए।

एक अन्य बर्तन लीजिए जिसमें, माना 5 वस्तुएँ रखी हैं। अन्य कोई वस्तु इसमें न रखिए। बच्चों को कहने दीजिए कि इसमें शून्य वस्तुएँ मिलाई गई हैं। उनसे बर्तन की वस्तुओं को गिनवाइए।

बच्चों को यह अनुभव करने में कि "पाँच और शून्य मिलकर केवल पाँच ही होते हैं" सहायता कीजिए।

अंत में समूहों और वस्तुओं का प्रयोग किए बिना दो संख्याओं का जोड़ ज्ञात करना सिखाना है। आप धीरे-धीरे कोई दो संख्याएँ, माना 2 और 4 बोलें। बच्चे से उनके जोड़ वाली संख्या बोलने को कहें। बच्चे को 6 कहना चाहिए। यदि उसका उत्तर गलत है, तो सही उत्तर प्राप्त करने में उसकी सहायता कीजिए। संख्याओं के कई जोड़े लेकर इस प्रक्रिया को जारी रखिए।

मौखिक प्रश्न

जोड़ना सिखाने का एक महत्वपूर्ण लक्ष्य व्यावहारिक जीवन की समस्याओं को हल करने में इसका प्रयोग करना है। आप समस्याओं को मौखिक रूप में बच्चों के सामने रखें और उनसे हल करने को कहें। पहले के अनुभव और परिपक्वता के आधार पर बच्चा इन समस्याओं को मौखिक रूप से हल करने में सक्षम होगा।

नमूने के रूप में नीचे कुछ उदाहरण दिये जा रहे हैं। बौद्धिक रूप में बच्चों को इन समस्याओं को सुलझाने के लिए कह सकते हैं। इसी आधार पर यह आवश्यक है कि आप कुछ अन्य प्रश्न बनाएँ जिनका उपयोग बच्चों के सीखने और उनका मूल्यांकन करने में किया जा सकता है।

समस्याओं के उदाहरण

1. नूरी के बॉक्स में 6 लाल पेंसिलें और 2 काली पेंसिलें हैं। उसके बॉक्स में कुल कितनी पेंसिलें हैं?
2. एक बाग में 4 आम के पेड़ और 3 संतरे के पेड़ हैं। बाग में कुल कितने पेड़ हैं?
3. अलमारी के एक शेल्फ में 2 पुस्तकें रखी हैं। उसी शेल्फ में 5 पुस्तकें और रख दी गईं। शेल्फ में कुल कितनी पुस्तकें हैं?
4. जॉन के पास 5 टॉफियाँ हैं उसकी माँ ने उसे 4 टॉफियाँ और दे दीं। अब उसके पास कुल कितनी टॉफियाँ हैं।

घटाव

घटाव के तीन चरण

घटाव की अवधारणा के तीन चरण हैं, जिनका आपस में घनिष्ठ संबंध है। किंतु बच्चे इस संबंध को पर्याप्त प्रायोगिक अनुभव के पश्चात ही समझ पाएँगे। ये तीन चरण हैं:

1. निकाल लेना : गौरव के पास 5 पेंसिलें हैं। उसने 2 पेंसिलें अपनी बहिन को दे दीं। उसके पास कितनी पेंसिलें शेष रह जाती हैं? अर्थात् $5 - 2 = ?$
2. तुलना : गौरव के पास 5 पेंसिलें हैं। अंकुर के पास 2 पेंसिलें हैं। अंकुर की तुलना में गौरव के पास कितनी अधिक पेंसिलें हैं? अर्थात् $5 - 2 = ?$
3. पूरक जोड़ : गौरव के पास 5 पेंसिलें हैं। अकबर के पास 2 पेंसिलें हैं। अकबर को कितनी पेंसिलें और दी जाएँ कि उसके पास पेंसिलों की संख्या गौरव की पेंसिलों की संख्या के बराबर हो जाए? अर्थात् $5 - 2 = ?$

'घटाव' का विचार मुख्यत: एक ऐसा विचार है जो किसी समूह में से कुछ निकालने का विचार प्रस्तुत करता है और ऊपर दिये गये अन्य दो चरण समस्याओं को सुलझाने के उद्देश्य के रूप में प्रयोग किए जाते हैं। हम केवल पहले वाले चरण अर्थात निकाल लेना तक ही सीमित रहेंगे।

घटाव की अवधारणा उस समय कार्यान्वित होती है जब किसी समूह की दी गई वस्तुओं में से कुछ को निकाल लिया (हटाया, नष्ट किया, खा लिया, मार दिया, उड़ा दिया, खो दिया, आदि) जाता है। प्रत्येक के अन्त में पूछा जाने वाला प्रश्न है: "कितने शेष रहते हैं?" इनमें वे परिस्थितियाँ भी सम्मिलित हैं जिनमें दिए गए समूह का एक भाग कुछ गुण रखता है जबकि दूसरा भाग उस गुण को नहीं रखता है तथा पूछा जाने वाला प्रश्न है: "कितनों में नहीं है?" या "कितने नहीं हैं? उदाहरणार्थ, प्रेम के पास 9 कुत्ते हैं। 2 कुत्ते काले हैं। कितने कुत्ते काले नहीं हैं?"

'घटाव' का परिचय देने के लिए अध्यापक के लिए निम्नलिखित गतिविधियाँ सुझाई गई हैं

1. कुछ वस्तुएँ जैसे पत्ते, कंकड, बीज आदि, इकट्ठे करिए। बच्चों से पूछें कि वह कितने हैं? उस समूह में से कुछ वस्तुएँ ले लीजिए और बच्चों से पूछिए आपने कितनी ली हैं? अब फिर पूछिए कि कितनी शेष बची हैं?
2. दो भिन्न रंगों की गेंद/पेंसिलें इकट्ठी करिए। बच्चों से पूछिए ये कितने हैं? कितनी लाल हैं? कितनी लाल नहीं हैं?

3. एक डोमिनो लीजिए। बच्चे से कार्ड पर बनें सभी छेद गिनने को कहें। दो भागों में से एक भाग को छुपा लें और पूछें, छुपाये हुए भाग में कितने छेद हैं?

4. जब छात्रों को ठोस वस्तु और चित्रों के द्वारा घटाव की प्रक्रिया का पर्याप्त अनुभव हो जाए, तब उन्हें एक संख्या में से दूसरी संख्या को घटाने के लिए कहें। अगला चरण इस तरह की समस्या को सुलझा देगा जैसे 4 – 2 =?

संकेतों का प्रयोग

पुस्तक में दिखाए गए चिह्नों की अपेक्षा ''निकाल लेना'' के लिए प्रयुक्त होने वाले चिह्न मूल रूप से ज्यादा कठिन हैं। ये कुछ-कुछ अस्पष्ट भी हैं। इसलिए इन्हें समझाते समय अध्यापक को अधिक सावधान रहना होगा, खास करके पृष्ठ 63 और 64 पर।

छिपी हुई संख्या का पता लगाने के लिए पृष्ठ 68 पर दिया गया विचार भी 5 और 6 साल के बच्चे के लिए कठिन है। इस पृष्ठ पर काम करने से पहले बच्चों को ठोस वस्तुओं या बातों द्वारा अनुभव देने का प्रयास करना चाहिए।

शाब्दिक प्रश्न

बच्चों को यह सीखने की आवश्यकता है कि घटाव की संक्रिया का "निकाल लेना (या विभाजित करना)" युक्त समस्याओं से कैसे संबंध स्थापित किया जाए। प्रयोग किए जाने वाले जिन मुख्य शब्दों को विकसित करना है, वे हैं: 'निकाल लेना', कितने बचे?' 'कितनों में नही है?', 'कितने नहीं हैं?'

'निकाल लेना (या विभाजित करना)' पर आधारित बहुत से सामान्य शाब्दिक प्रश्न विकसित कीजिए तथा उन्हें एक-एक करके मौखिक रूप से बच्चों के सम्मुख प्रस्तुत कीजिए। बिना स्थूल सामग्री प्रयुक्त किए उनका उत्तर बताने के लिए बच्चों को प्रेरित कीजिए। आपकी सहायतार्थ कुछ प्रश्न नीचे दिए गए हैं:

प्रश्न

1. रीना के पास 4 सेब हैं। वह उनमें से 2 सेब अपनी सहेली अंजु को दे देती है। रीना के पास अब कितने सेब बचे?
2. एक पेड़ पर 3 चिड़ियाँ बैठी है। एक चिड़िया उड़ गई। पेड़ पर अब कितनी चिड़ियाँ बैठी हैं?
3. एक पेड़ पर 3 तोते बैठे हैं। एक तोता उड़ गया। पेड़ पर अब कितने तोते रह गए।
4. एक लड़की के पास 9 गुब्बारे हैं। उनमें से 3 गुब्बारे फट गए। लड़की के पास अब कितने गुब्बारे हैं?
5. वेदिका के पास 18 पेंसिलें हैं। उनमें से 3 पेंसिलें लाल हैं। कितनी ऐसी पेंसिलें हैं जो लाल नहीं हैं?

10 से 20 तक की संख्याएँ

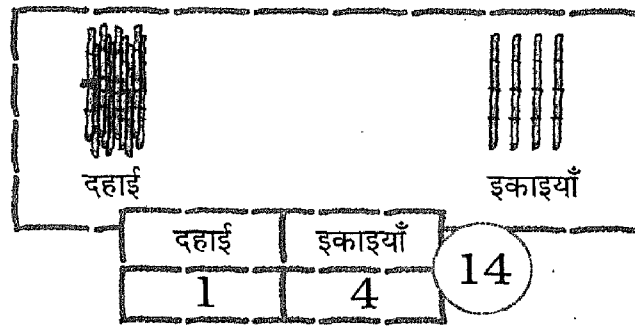
जब तक बच्चे इस पुस्तक के पाँचवें अध्याय तक आते हैं तब तक उनकी गणितीय भाषा, योग्यता और विशेषताओं की आधारभूत समझ बन जाती है। अंक प्रणाली की समझ को आगे बढ़ाने के लिए कुछ उपयोगी बातें निम्नलिखित हैं:

1. नौ तक गिन सकें।
2. नौ तक के अंक पढ़ और लिख सकें।

3. बच्चों को स्वयं व अपने साथियों के साथ संख्या कार्ड प्रयोग करके सीखने का अनुभव हो।
4. शून्य को एक अंक की तरह समझें और शून्य को पढ़ व लिख सकें।
5. मौखिक व लिखित रूप में जोड़ व घटा सकें।

अंक प्रणाली को समझने में सहायता करते हुए हमें ध्यान रखना चाहिए कि 10 से 20 तक गिनती को पढ़ने व लिखने को जानना बच्चे के लिए एक आधारभूत विकास है। अंकों को लिखना दस के शुरू होते ही नियमबद्ध होता है। नौ तक की गिनती को बच्चे केवल अभ्यास द्वारा ही सीख सकते हैं। 3, 5 या 8 को लिखने में कोई नियम नहीं है। पर 10 अथवा 17 और दस के बाद की संख्या को समझने का एक निश्चित नियम है। अथवा ठीक से कहा जाए तो नियमों का समूह है। अंक प्रणाली का मूल आधार 10 (जिसे कि हम प्रयोग करते हैं), 10 का एक समूह बनाने की संकल्पना से बना है और अंक का स्थान उस समूह का आकार बताता है। उच्च प्राथमिक कक्षा तक की अंकगणित की समझ के लिए यह संकल्पना आधार का काम करती है। इस अध्याय में यह प्रयत्न किया गया है कि बच्चा अंक प्रणाली की मुख्य अवधारणाओं को समझने की शुरुआत अपने स्वयं के अनुभवों से 10 से आगे के अंकों का सृजन करके करे। इसलिए इस अध्याय के बारे में यहाँ कुछ अधिक विस्तार से समझाया गया है।

पुस्तक में काम करने से पहले की तैयारी –

1. **20 तक गिनना :** अलग-अलग गतिविधियों, व्यावहारिक अनुभवों और ठोस वस्तुओं के प्रयोग से बच्चों को 20 तक की गिनती सिखाएँ। वे यह सब कर सकें :
   क. 20 तक की संख्याओं के नाम बोल सकें।
   ख. वस्तुओं के समूह में से 20 वस्तुएँ या उससे 'X' कम या बराबर दें सकें।
   ग. दी गई वस्तुओं के समूह में बताइए कि संख्या X 20 वस्तुओं के बराबर है।
2. बच्चों को 20 छोटी तीलियाँ इकट्ठी करने के लिए कहें, जो माचिस की तीलियों से थोड़ी सी बड़ी और मोटी हों या कह सकते हैं कि लंबाई में 5 सेमी. और पेंसिल से थोड़ी सी पतली हों। बच्चों से 10 तीलियों का एक बंडल बनाने को कहें। इसे वे रबड़ या धागे से बाँध लें। शेष 10 तीलियों को खुला रहने दें।
3. बच्चों से तीलियों को अपने सामने रखने को कहें। फिर कक्षा से कहें कि वे आपको बिना बंडल खोले 14 तीलियाँ दें। कुछ बच्चे अवश्य समझ जाएँगे कि यह कैसे करना है। यदि इसे कोई नहीं कर पाता है, तो आप उसे तीलियों का एक बंडल और 4 खुली तीलियाँ दिखाएँ। बच्चों से 13, 16, 19, 10, 14, आदि देने को कहें तथा इसके लिए उन्हें कुछ अधिक समय दें। माँगें जाने पर बंडलों और खुली तीलियाँ देने के लिए बच्चों में आत्मविश्वास आ जाएगा।
4. जब बच्चों में 19 तक की संख्या के साथ तीलियों और बंडल के रूप में काम करने का विश्वास आ जाए तब बोर्ड पर, उदाहरण के तौर पर एक बंडल और सात खुली तीलियाँ बनाने को कहें और उस संख्या को नाम दें। अधिकतर बच्चे इसे एक दिन में ही सीख जाएँगे।
5. अगला कदम होगा कि बंडल और तीलियों के नीचे उनकी संख्या लिखें और उपरोक्त 4 में दिए गए अभ्यास को दोहराएँ।
6. इस अवधारणा पर अधिक से अधिक रोचक क्रियाकलाप बनाइए और बच्चों को तीलियों से अच्छा अभ्यास कराइए, उनसें कोई एक संख्या पूछिए, और उस संख्या की जाँच कीजिए, ब्लैकबोर्ड पर बंडल और तीलियाँ बनवाइए, उनकी संख्या लिखवाइए तथा पढ़वाइए आदि। यदि इस संपूर्ण प्रक्रिया में 10 दिन लग जाएँ तब भी चिंता की कोई बात नहीं है। जब तक बच्चों को इस क्रियाकलाप में आनंद आए तब तक इसे जारी रखें।

पुस्तक में काम करना

1. यदि अध्यापिका/अध्यापक ऊपर लिखे तरीके से काम करते हैं या बेहतर ढंग से आत्मसात् किए गए ऐसे अन्य तरीके से जिसमें वे सभी अवधारणाओं पर ध्यान देते हैं, तो बच्चों को पुस्तक के पृष्ठों पर काम करने में कोई कठिनाई नहीं होगी। और अध्यापिका/अध्यापक को भी यह समझने में कठिनाई नहीं होगी कि उसे प्रत्येक पृष्ठ पर बच्चों से क्या आशा रखनी है।
2. बच्चे जब पुस्तक में काम कर रहे हों तब उन्हें स्वतंत्र रूप से बातचीत व चर्चा करने दें और पुस्तक में अभ्यास के लिए बंडल और तीलियों का प्रयोग करने दें।
3. पुस्तक के पृष्ठ 70 पर 10 का समूह बनाने का अभ्यास दिया गया है जो कि अंक प्रणाली के लिए जरूरी है, पृष्ठ 71 और 72 पर 10 के समूह बनाने, दहाई और इकाइयाँ और अन्य अंकों के लिखने का अभ्यास दिया गया है। बच्चों में ऐसी क्षमता विकसित होनी चाहिए कि वे इसे कर सकें।
4. पृष्ठ 73-74 उन अंकों और संख्याओं को क्रमबद्ध करता है जिन्हें बच्चे पहले से ही लिखना व पढ़ना जानते हैं।

   इसी तरीके से आप अंक प्रणाली को 50 तक और फिर 100 तक बढ़ा सकते है।

समय

समय का सबसे पहला व्यवहारिक उपयोग है बच्चों को प्रतिदिन की दिनचर्या के क्रम से परिचित कराना। बच्चे के लिए दिन की शुरुआत तब से होती है जब वह उठता है। उसके बाद दिनचर्या प्रारंभ होती है; जैसे- दाँतों की सफाई, नहाना, नाश्ता करना, स्कूल जाना, मध्यावकाश (आधी छुट्टी), घर वापस आना, आराम करना, खेलना, गृहकार्य करना, माता-पिता की कुछ-कुछ कामों में सहायता करना, टी. वी. देखना और रात को सोना। सोने के साथ ही उसका दिन समाप्त हो जाता है।

बच्चों को समय-आधारित कुछ ऐसी गतिविधियों से परिचित करवाया जाए जो उन्हें पहले, बाद में जैसे शब्द समझने में सहायता करें। बच्चों को उनकी अपनी दिनचर्या के क्रम के बारे में बताने को कहें और हो सके तो वे सोने जाने से पहले अपनी कॉपी में इसे लिखें।

बच्चों का इस बात की ओर ध्यान दिलाया जाए कि हमें किसी काम को करने में कितना समय लगता है और इसका हिसाब भी हम लगा सकते हैं।

छोटे बच्चों का कितना समय निकल गया या बीत गया की समझ अच्छी नहीं होती। उन्हें लगता है कि एक मज़ेदार खेल बहुत ही थोड़े से समय के लिए रहा जबकि एक नीरस कक्षा काफी लंबे समय तक चलती रही। बच्चे अगर समय का हिसाब रखना शुरू कर दें तो इस गलत धारणा को समाप्त किया जा सकता है।

शुरुआत में बच्चों को समय के छोटे-छोटे अंतराल के बीतने को देखने, सुनने, महसूस करने और समझने दें। इसके लिए आप एक साधारण सा समय मापने का यंत्र बनाएँ जैसे कि पेंडुलम (लोलक)। इसे आप धागे के एक

छोर के साथ छोटा सा कंकड़ अथवा कोई और भारी-सी वस्तु बाँधकर बना सकते हैं और दूसरी ओर से इसे लटका दीजिए।

इस पेंडुलम का उपयोग निम्न गतिविधियों में लगे समय के बारे में बताने के काम भी आ सकता है:

1. जब तक आप अपने जूते के फीते बाँधते हैं, तब तक गिनिए कि यह पेंडुलम कितनी बार झूलता है।
2. पता लगाइए किसने फीता बाँधने में सबसे अधिक समय लिया।
3. गिनिए कि यह कितनी बार झूलता है जब आप घर का चित्र बनाते हो, खेल के मैदान को चलकर पार करते हो और उसी को दौड़ कर पार करते हो, आदि।

माप

(क) लंबाई

दो वस्तुओं की तुलना

दों वस्तुओं की तुलना करने के लिए दो अलग-अलग लंबाई की छड़ें लीजिए। इन छड़ों को दिखाकर प्रश्न पूछिए; जैसे – इनमें से कौन सी छड़ लंबी या छोटी है। ऐसे ही दो पेंसिलें लेकर हम पूछ सकते हैं कि इनमें से कौन सी पेंसिल लंबी है या कौन सी छोटी है?

ऐसे ही बहुत सारे उदाहरण लेकर लंबे-छोटे की तुलना की जाए। उदाहरण के लिए, बच्चे यह समझें कि यदि नीली पेंसिल लाल से लंबी है, तो इसका मतलब है कि लाल पेंसिल, नीली पेंसिल से छोटी है।

आप बच्चों से पूछ सकते हैं :

- इस कलम से लंबी वस्तुएँ बताइए।
- कक्षा में कौन-कौन आपसे लंबे हैं?
- इस छड़ी से छोटी वस्तुएँ बताइए।
- कक्षा में कौन-कौन आपसे छोटे हैं?

इसी प्रकार बच्चों को नीचे दी गई माप से संबंधित शब्दावली का परिचय दीजिए :

- लंबा-छोटा
- ऊँचा-छोटा
- पतला-मोटा
- मोटा-उससे मोटा

संरक्षण (स्थिरता) अनुभव

अंत में बच्चों को संरक्षण (स्थिरता) अनुभव अर्थात् लंबाई की समतुल्यता का अनुभव दीजिए। बच्चों को अनुभव के आधार पर शब्दों से जैसे कि ''उतना लंबा जितना, उतना ऊँचा जितना, उतना मोटा जितना, आदि'' से परिचित कराएँ।

कौन सा टुकड़ा लंबा है?
क्या दोनों समान लंबाई के हैं?
क्या प्रत्येक पट्टी दूसरे के जितनी ही लंबी है?

कौन सा टुकड़ा लंबा है?
क्या दोनों समान लंबाई के हैं?

वस्तुओं को उनकी लंबाई के अनुसार क्रम में लगाना।

जब विभिन्न लंबाई, चौड़ाई या ऊँचाई वाली तीन या अधिक वस्तुएँ दी हों तो उन्हें देखकर उनके आकार के अनुसार उन्हें क्रमबद्ध किया जा सकता है, तत्पश्चात सीधी तुलना द्वारा उनकी जाँच की जा सकती है। (वस्तुओं

में भिन्नता का बिल्कुल निश्चित होना आवश्यक है।) इस अवस्था में बच्चों को लंबाई के सर्वोत्तम रूपों, जैसे कि सबसे लंबा, सबसे छोटा, सबसे ऊँचा, सबसे मोटा, सबसे पतला, आदि से परिचित कराएँ।

(ख) भार (द्रव्यमान)

दो वस्तुओं की तुलना

बच्चों द्वारा वस्तुओं के भार ज्ञात करने से पहले उन्हें भारी-हलका, से भारी, से हलका आदि की जानकारी अवश्य होनी चाहिए।

आरंभ में ऐसी दो वस्तुएँ लीजिए जिनमें से एक दूसरी से पर्याप्त भारी लगे जैसे कि एक तरबूज तथा एक नींबू, एक पुस्तक तथा एक कलम।

वस्तुओं को हाथ से उठाने पर महसूस करके उनके भारों की तुलना करना:

बच्चों के सम्मुख समान आयतन किंतु भिन्न भार वाली वस्तुएँ रखिए। उन्हें भार की मूल शब्दावली की जानकारी दीजिए।

लाल डिब्बा भारी है। हरा डिब्बा हलका है।

लाल डिब्बा, हरे डिब्बे से भारी है।

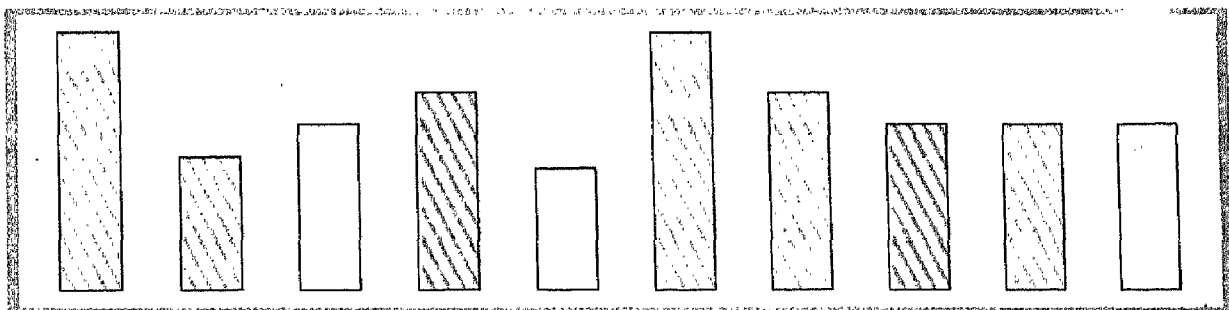
हरा डिब्बा, लाल डिब्बे से हलका है।

भार के आधार पर तीन या अधिक वस्तुओं में क्रम-निर्धारण

जब विभिन्न भार वाली तीन या अधिक वस्तुएँ दी गई हों, तो वस्तुओं को हाथ से उठाने पर महसूस करके उनके भारों की तुलना की जा सकती है (भारों में पर्याप्त भिन्नता होना आवश्यक है)। इस अवस्था में बच्चों को भार के उत्तम रूपों - सबसे भारी, सबसे हलका, आदि से परिचित कराएँ।

आंकड़ों का उपयोग

आंकड़ों का उपयोग किसी संकेत या चिह्नों की सहायता द्वारा दी गई सूचना को स्पष्ट करने का एक साधन है। जैसे कि :

बच्चों को विभिन्न रंगों की कागज की पट्टियाँ देकर उनको इन पर अपने नाम लिखने को कहिए पूरी कक्षा को जोड़ों में बाँट दीजिए।

प्रत्येक बच्चे को कहें कि वह अपने साथी के कागज की पट्टी को अपनी बाजू की लंबाई के बराबर बनाए और फिर एक दूसरे की बाजू की लंबाई नापें। इन सब पट्टियों को इकट्ठा कीजिए। इनमें से कोई भी दस बाजू की लंबाई की पट्टियों के नमूने चुनिए। इन पट्टियों की लंबाई की तुलना करिए। पट्टियों को दीवार पर प्रदर्शित कीजिए।

किसकी बाजू सबसे लंबी है? किसकी बाजू सबसे छोटी है?

उन बच्चों के नाम बताइए जिनकी बाजू की लंबाई एक जैसी है?

पैटर्न

पैटर्न की समझ बच्चों को संबंधों को देखने, जुड़ाव को ढूँढ़ने और परिणाम निकालने, सामान्य नियम का रूप देने और भविष्य के बारे में सूचना देने में मदद करती है। पैटर्न की समझ ऐसी गणितीय सोच विकसित करने में सहायता करती है जो बच्चे को विचारक बनने और समस्याएँ सुलझाने में निपुण बनाती है। यह एक समस्या सुलझाने का साधन है। अध्यापक गतिविधि की शुरुआत पैटर्न से तालियाँ बजाकर करें। जैसे :

1 - 1 - 1 ___________

2 - 2 - 1 ___________

1 - 2 - 3 - 1 - 2 - 3 ___________ आदि

अध्यापक कक्षा में एक स्टैम्प पैड लाएँ। सभी बच्चों को सादा कागज दें और उन्हें कागज पर अँगूठे की छाप कैसे लेते हैं, दिखाएँ। उन्हें अँगूठें की छाप लेकर अलग-अलग पैटर्न बनाने को कहें।

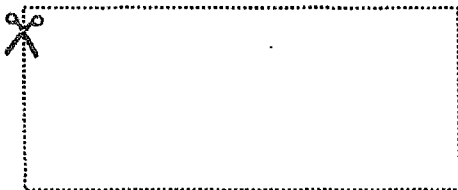
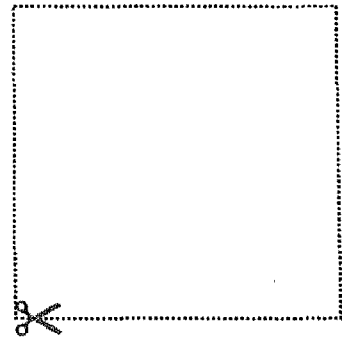
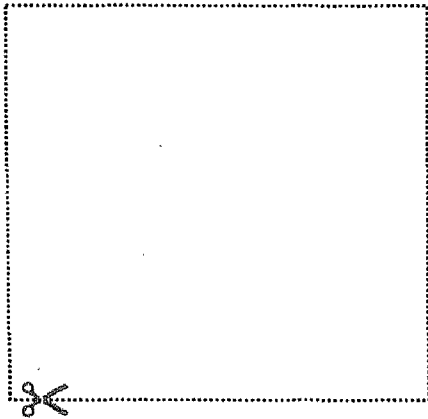
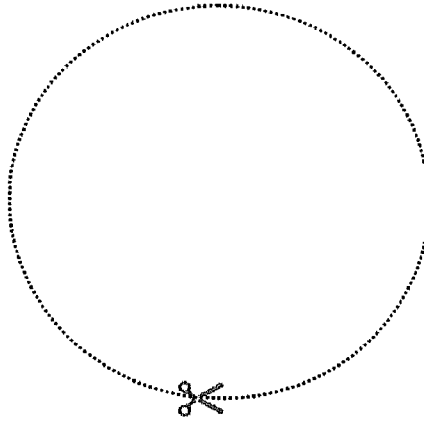
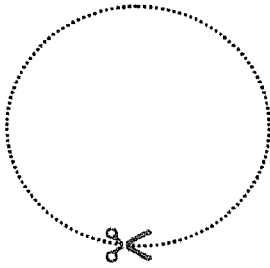
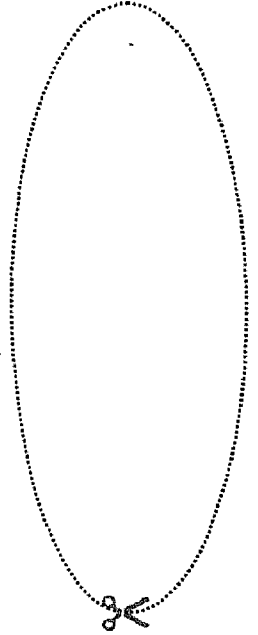
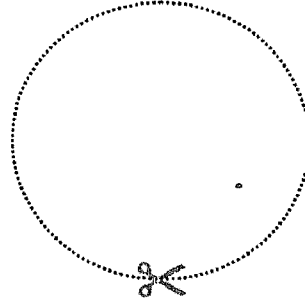
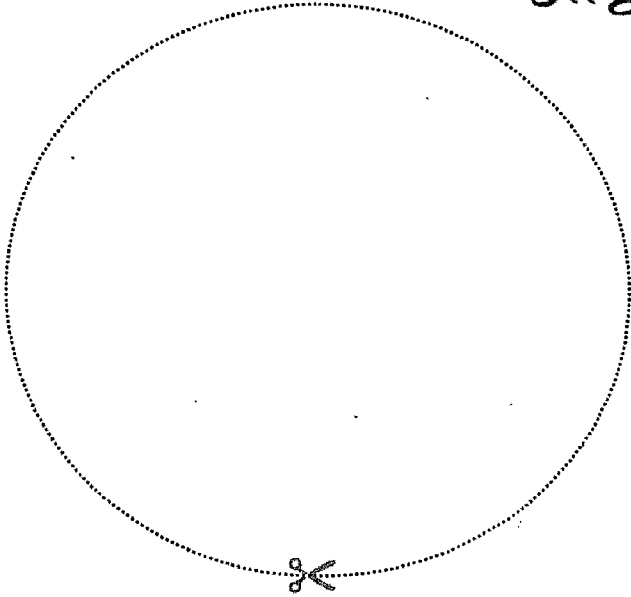
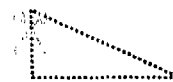
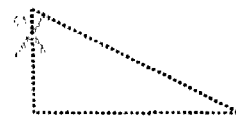
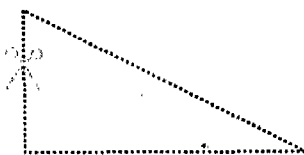
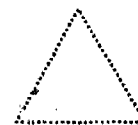
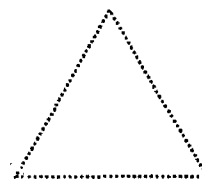
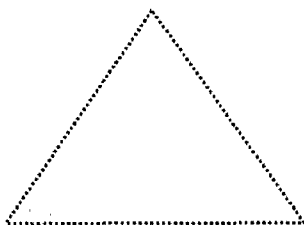
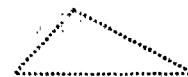
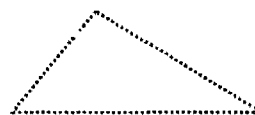
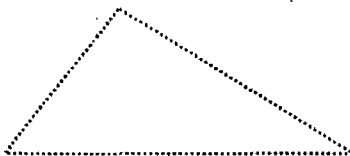
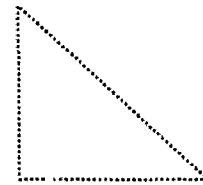
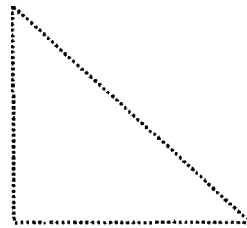
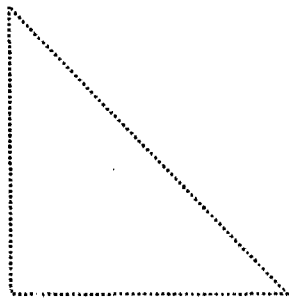
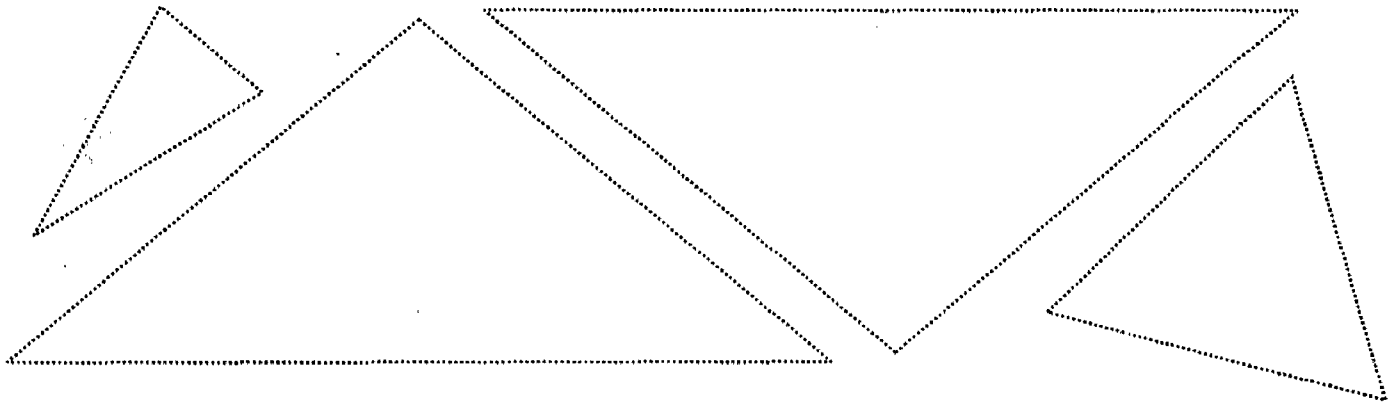
अध्यापक पुस्तक के पीछे दी गई आकृतियों की सहायता से भी अलग-अलग पैटर्न बना सकते हैं।

मुद्रा

पुस्तक का यह अध्याय बच्चों को सिक्कों और नोटों के संग्रह को समझने, विनिमय करने का अनुभव प्रदान करने के लिए है।

अध्यापक कुछ नए क्रियाकलाप बनाएँ या नीचे सुझाए गए क्रियाकलापों का भी प्रयोग कर सकते हैं:

1. बच्चों से बातचीत करके, प्रश्न पूछकर उन्हें सिक्कों और रुपयों का परिचय दें।
   क. हम पेंसिलें, रबड़, मिठाइयाँ आदि वस्तुएँ कहाँ से खरीद सकते हैं?
   ख. दुकानदार से सामान खरीदने के बाद हम उसे क्या देते हैं?
2. जब आप विभिन्न मानों के सिक्के और नोटों का परिचय दे दें तब बच्चों से एक जैसे सिक्के, उदाहरण के लिए 50 पैसे के सिक्के को अलग करने को कहें।
3. एक टूथपेस्ट का खाली पैक, साबुन का रैपर आदि लेकर आएँ। बच्चों से पैक पर लिखा मूल्य पढ़ने को कहें और एक सिक्का या नोट को सिक्कों और नोट के संग्रह में से उठाने को कहें जिससे वह इस वस्तु को खरीद सकता है।
4. उनको समान या विभिन्न मानों के कुछ सिक्के या नोट दें और उन्हें इनका कुल मूल्य बताने को कहें।
5. छात्रों से इन विभिन्न मानों के सिक्कों और नोटों के उपयोग से एक दी गई राशि बनाने को कहें।

आकृति किट

group activities are dominant, such as sociology, dramatics, dancing, physical education, and the like, and in extracurricular activities. The counselor should make good use of data from these sources whenever they become available and check them against similar findings from the longitudinal case histories of his counselees Such materials often throw a clear light on previously obscure reasons as to why a counselee is succeeding in his academic work beyond his estimated abilities or is failing in it because of anxieties generated by his social isolation on the campus They may also give illuminating insight into behavior patterns that will mean acceptance or rejection in employment and thus strengthen the counselor's prognosis and increase the validity of his predictions

SEMANTICS AND PROJECTIVE DEVICES

Experienced counselors are well aware that many of the problems which trouble people cannot be discovered by direct questioning. Counselees may reveal easily information about themselves which has little or no emotional toning. Many shut up like clams when asked about matters which have deep personal implications. Some causes of confusion, conflict, and suffering are so deep-seated that the counselee cannot disclose them because they are well hidden even from himself or they are buried under long-established surface rationalizations. Psychologists and related professional workers have spent much time, energy, and brains in the quest for tools and techniques which will open up these hidden sources of maladjustment. The quest has been fruitful and the evidence lies in part in semantics and in part in the well-known results of the development of projective devices.

Semantics as a Counseling Tool

It is increasingly being recognized that organized and intensive study of semantics provides one of the newer and

more promising tools for the counselor. Formal training in it must still, for the most part, be self-training, since there are as yet few higher institutions offering formal courses in the field, and few individual college teachers who introduce portions or condensations of it into other courses in education, psychology, logic, or English. But the counselor in training or in practice will find reading in this field richly rewarding A short list of basic materials on semantics is appended to this chapter. It is our intention here not to go into the theory of semantics at length, but to suggest some of the ways it may be used in counseling practice as one instrument for speedy identification of some of the underlying causes of student problems and as a method for helping to clarify them.* While not many counselors have yet consciously acquired skills in its use, numbers have unwittingly stumbled upon a few of its elements and employed them with satisfactory results.

In the practical clinical situation, the use of semantics as a tool for diagnosis and therapy is largely a matter of the counselor developing the ability rapidly to analyze the speech and writing of his counselee, to judge the words he uses, the meanings he appears to assign to them, and his behavior reactions to his own and the counselor's words as *symptoms* and even as *causes* of problems, confusions, and conflicts. It is too easy for the neophyte counselor to skim a personal history or an autobiography and gather from it only a general impression and a cluster of factual details and to miss entirely the *significance of the way in which things are said.* It is also far too easy to do the same thing in an interview, to listen with "half an ear," to jot down in the case notes only items like "owes $100," "in army 4 years" or such generalizations as "thinks he wants engineering" or "wants to be married." Useful as these

* For an extensive treatment of both basic theory and suggested application in counseling as well as a review of clinical experiments in schools, see Camp, N H, Jr. *A Semantic Approach to Guidance* Unpublished doctoral thesis, University of California, Los Angeles, 1948

may be, a counselor employing semantics will find himself looking or listening for verbal signs of inner rigidities, anxieties, misunderstandings, bewilderment, and tensions. Just as, in simpler fashion, a sensitive mother can distinguish between the modes of crying of her baby and know which means that he is hungry, sleepy, angry, or in pain, so a skilled semanticist can identify certain far more complex central tendencies in the personality of a student whom he is counseling, by reading and listening to the words he uses and observing the way he uses them.

Murphy,[14] in discussing this concept, states part of the basic theory of applied semantics in counseling when he says:

> Personality differences are in large measure individual differences in response to symbols. A word, a gesture, a nod symbolize different things to different people. Two children in the sandbox live in two different worlds, two men behind roll-top desks respond utterly differently to the same appeals for charitable contributions.
>
> Yet we have told only half the story when we say that individuals respond differently to different symbols. People carry around within them their own symbols, their own inner cues keep them oriented to distant objects. . . . As life goes on, people develop more and more symbolic activity of this type, activity that refers to the world with which they deal, the personal world is largely comprised of the idiom of these personal systems of symbolism. The stuff of such symbolism proves, in most people, to be largely patterns of *words* acquired early and constantly enriched and complicated through use in a wider and wider variety of situations. . .
>
> Even at two and three, vocabularies differ greatly. Between three and six, vocabulary may be an especially revealing clue, some children frequently use feeling tone words* which are

[14] Murphy, Gardner. *Personality* New York Harper & Brothers, 1947 See especially Chap 11, "The world of symbols" and Chap 12, "The world of values," pp 247–295

* The authors observed a three-year-old who used such expressions as "My granddaddy is not a dirty brat," talked about "a soft gray

never used by others. Even at college age it is possible to formulate a picture of personality comparable to what is available through formal projective tests by systematic analysis of language patterns.

Murphy further points out an important principle, which is that our world of symbols and our world of action are not separate and different but constantly interact upon one another, building up new patterns of both or destroying old ones, so that there is at once a continuous crossflow and a forward movement. He shows that we are forever talking to ourselves at the silent level, and, by so doing, drive ourselves to act and, as we act, our overt behavior reforms and enriches what we say both to ourselves and others. He finds, therefore, that, when life presents us with a problem, an ambition, a danger, we inevitably express our feeling and thinking about it in words and mannerisms. Because the more intensely we feel and think about problems the more concentrated and vivid is our language, we reveal to an alert counselor in our writing and talking the things we most value or most fear and thus uncover our pattern of values which is one of the dynamic sources of what we are and what we do. Thus our words will show him whether our major drives are for power, money, beauty, religion, affection, prestige, or escape from trouble. We uncover our idealizations and our despisings, our successes and our failures. We demonstrate whether our attitudes are structured to make us tolerant, rigid, "cocky," irritable, timid, tough, friendly, etc., and these are basic to the counselor's diagnosis of our problem, to his analysis of alternate paths to progress, and to accuracy of his prediction as to how we will come out if we follow one path or the other. As Murphy[15] says,

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creature" and "a ferocious hippopotamus," and, while playing with a pair of china pigs and being asked what the one said to the other, answered, "They can't talk, they are inanimate."

[15] Murphy, *op cit.*, p. 282.

It is not only the poet who betrays himself in his favorite words; every person's favorite words suggest patterns for classifying the world and his relation to it. Within the matrix lie a few words which, because they represent ways of regarding the self, are among our most important clues to the study of personality.

A considerable body of research has been devoted to semantics, but much more is needed both to analyze it as a tool and to discover the techniques for its increasingly efficient employment. While it is not possible in the short space here available even to summarize all of the most effective uses of semantics in educational-vocational counseling, it is hoped that the following samples of more easily used methods may stimulate the reader to undertake extensive reading and self-training. Some, then, of the things for which a counselor may profitably watch in the autobiographies and themes of students and especially in their talking in the interviews are these.

1. Clarity or confusion in questions. Clear answers may be found only to clear questions. To confused ones, there are no answers School and college counselors are continually beset by such unanswerables as, "Is medicine better than law?" with never a qualifier as to what area within the field, and what level within the area is "better" for whom? at what time? under what circumstances? Again they are asked "What is the secret of success in college and career?" without the asker having any real notion of the many meanings of "success" or of "secret." Or such a question as this is fired at them. "I read an article on *Personality, the Key to Big Jobs.* How can I develop a personality?" Such questions indicate vague and confused thinking and feeling and should alert the counselor to the fact that he has a long and difficult task ahead in helping his counselee to sharpen his symbol system to the point where he can ask questions that can be answered, can formulate such queries as these, "I am puzzled about whether to take a course in law or medicine. What do I have to do to find out how long each takes to complete?

what the costs are? what kinds of jobs there are in the two fields? etc." Or "My friends tell me that I give too many people the impression that I look down on them. What do I do to give this impression? How can I correct it?" Unfortunately most of our formal education is centered on training people to answer questions, not to ask them, and those that teachers ask are often unanswerable.

2. *Evidences of unconscious projection.* A sane and well-adapted student knows that in interpreting ideas, events, and processes he projects himself, his background, his experience, and his feeling into his interpretations, and that these are different from those of others and different, too, from his own at an earlier or a later time. He will, therefore, in his use of language constantly qualify his statements with such phrases as "it seems to me," "I think," "I assume," "it looks to me as if." If, on the contrary, he is unaware that he is projecting he will make unqualified flat statements such as, "Economics is a lousy course," or "This university has high standards, is the best in the country," or "Nobody likes me," or "I have a fine mind." In serious neurotic or psychotic states such language patterns are the clearest of clues to disturbance in patients and reveal the fantasies of the schizophrenic or the delusions of the paranoic. Even within the normal range, however, the watchful counselor can readily pick up this kind of verbal clue to attitudes and conflicts of his counselees.[16]

3 *Overdependence on or cynicism toward authority.* In the things that students write and say it is comparatively easy for a watchful counselor to identify a tendency that may range from one counselee's accepting as gospel truth everything that the counselor, teacher, dean, or parent says; through a rational balanced questioning of authority expressed in such questions as "How does he know?" "What does this really mean?" etc.; to a negativistic cynical rejection of all authority as in such statements as "The Bible is

[16] See especially Johnson, *op, cit*, pp. 60–65, and Murphy, *op. cit*, Chap. 27 and 28, pp. 646–700.

the bunk," "All professors are long-haired and impractical," "You can't believe anything the boss says because he's just trying to get work out of you and make profits," etc Counselee statements, indicating either overacceptance or habitual rejection of authority, will serve as warnings to the counselor that he probably has a complex and difficult job to break either one of these habitual attitudes before he can begin a rational analysis with the student of his vocational-educational problems.

4. *Ability to distinguish facts from opinions and inferences.* This is obviously closely related to "projection" and "authority" but serves as a further guide to analysis of the writings and speech of counselees. It has to do primarily with the process[17] of abstracting at various levels from the submicroscopic to the highest inferential. What this shows is that many of the problems and confusions of counselees arise from their being conclusion-jumpers One observes the fact that Professor So-and-so looks grim this morning, his mouth is set, he passes by without saying "hello," and one jumps to the conclusion that he is angry at one. The professor's appearance is a fact. The inference drawn is not fact. He may have lost money, had a death in the family, been up too late at a party the night before, or any one of many things may have led to his dourness this morning. Similarly, a counselee may conclude that because his grandfather was a successful preacher he "has preaching in his blood" False abstractions of this sort, generalizations founded on insufficient evidence, are all too common in human speech and writing and serve as important clues to individual quandaries.

5. *Identification* One of the basic symptoms, and often

[17] For treatments of this process see, Korzybski, Alfred *Science and Sanity.* Lancaster. Science Press, 2d ed. 1941, on "The structural differential", Johnson, *op. cit.*, Chap V, "The world of not-words," pp. 91–111, and Camp, *op cit*, pp 107–119, and for an illuminating application of this formula see, Vogt, William. *Road to Survival.* New York: William Sloane Associates, 1948 Pp. 48–56.

one of the causes, of people's troubles is that they identify words with things. While this is clearly observed in an insane patient who falls down because he tries to sit on the word "chair," it is not so sharply seen in the common habit practiced to their continuing confusion by most individuals This is the habit of thinking and talking as if a word, a name, a label, a symbol, pinned down the thing it identifies and that the thing is always the same, all the time. Thus we get into manifold troubles by acting as if a boy labeled John Smith is the same today as he was yesterday and will be the same tomorrow, when any sane person knows that, so long as he is alive, he is changing.

6. *Allness.* Related to identification is the habit of assuming that all Negroes are the same as one Negro, all "Reds," all Methodists, all Republicans, all bankers, all union organizers, all professors, all small boys, are the same as one We mistake the map for the terrain like the youngster who, on his first airplane flight, was astonished and disappointed that the state of New York was not all blue, and Pennsylvania yellow and Maryland pink. Parents and teachers sometimes think that one misdeed brands a boy as "all" bad. A counselor in school or college frequently finds that his counselees say they "know all about" a course of study, a group of people, or an occupation Failing to recognize that nobody can know all about anyone or anything, such counselees are frequently in trouble, since they talk and act in accord with their arrogant idea of complete knowledge They are bored with, and frequently fail in, their courses because they think they "have already had that stuff" They foul up their social relations because they think that "all fraternity men are high-hat" or "all sorority girls are pretty nitwits" More dangerous still is the feeling that "all others have it in for me."

7. *Either-orness* Another verbal warning flag that counselors trained in semantics will watch for is phrasing that shows the counselee sees many, or most, things in extreme contrast. He appears to be incapable of appreciating the

always present gradations between extremes. A classmate is either "brilliant" or a "moron," a teacher or an occupation is to him either "wonderful" or "lousy." He is to himself either a "success" or a "failure" and the things he does are "good" or "bad." Any student grounded in this habit is constantly in trouble. The counselor has a tough task to get him to see, for example, the principle of his own multipotentiality, or to understand the concepts of job families, occupational fields, and levels. It is hard to get him to realize that "high" mechanical ability does not necessarily land him for life in a machine shop but may be essential to his career as a surgeon, a pianist, or an air pilot.

8. *Verbal output.* Both talking or writing too much and too little are also indices to a counselor of students in difficulty. Students who blurt and babble and those who are tongue-tied both show symptoms of a variety of confusions, anxieties, and attitudinal problems that need probing and therapy. The overglib, fast talker is almost certain to be a poor listener. He is likely also to reveal rigidity in his thinking, talking endlessly about the same things in much the same verbal patterns. To get him to slow down, to stop, look, and listen, to read, and to ponder may often be the only way to help him get out of a deep mire of half-truths and come to an understanding of himself, his schooling, and his proposed work. The hesitant, slow, stumbling talker or writer usually evidences in what he says, and even more in what he does not say, disorganization of his symbolic systems. Unless and until the counselor can help him to reorient and structure them he is unlikely to make progress toward solution of his educational-vocational problems.

From this brief discussion of semantics as a counseling tool, it seems clear that many clues to counselees' difficulties and many means of finding ways out of them lie in their written and spoken language, in the way in which they say things, and in the mannerisms, posture, gesture, facial expression, and the like, which accompany the flow of talk or pen. It is hoped that the reader will explore the litera-

ture in this important field and steadily expand his knowledge of and practice with it in educational-vocational counseling.

Projective Devices

Projective devices make use of the magician's hand-is-quicker-than-the-eye device of misleading They permit the trained observer to go behind the masks which all of us wear and to observe much of our real selves without our being aware of what is taking place. Sound training and long experience make the clinical psychologist and psychiatrist competent to analyze with more than a fair degree of accuracy what underlying factors are the cause of trouble. It is obvious that this process is perilous for any counselee who is subjected to such probing by an unskilled, awkward amateur. High school and college counselors who deal primarily with the "normal" problem categories from day to day will use projective instruments only with extreme caution unless they are highly trained, and, even then, they will be wary of their interpretations and check them with a specialist.

In any case the skilled general clinical counselor cannot afford to be ignorant of such important tools and the techniques developed for their use. Their values in clinical work cover the whole range from simple educational-vocational to the most complex emotional problems. In the former, they often reveal interests, attitudes, prejudices, and fantasies that inhibit successful achievement in school and college or on the job. In the latter they may speedily uncover areas of fear, rage, and anxiety and give an inkling of their causes.

Examples of projective devices are: free and controlled word association tests, including the psychogalvanometer or lie detector; open-end sentence tests, the various thematic apperception tests, the Rorschach inkblot test; play therapy; and the psychodrama. Despite surface differences

among these various types, they are closely akin in their common function of tapping the inner deeps of the counselee's personal life. We shall give here only the briefest description of a few of these tools and leave the reader to explore as far as he may the extensive literature about them.

Word association tests. In simplest form these consist of handing the counselee a printed or mimeographed list of words, or writing these on the board, or speaking them aloud to him. His task is to write down or say instantly what the word given reminds him of. The essence of administering such a test is a fast delivery and instantaneous reaction on the part of the subject, since we want his "projection" of meaning before he has time to think, to put up his guards. When the tests are used in connection with semantic tools of counseling and checked against other elements of the case history, the unfolding of individual differences is often startling. Thus if we give the word "hanging" to different students the responses may be as widely varied as "lynching," "pigtails," "cretonne drapes," "that so-and-so is too good for . . . ," "Dachau concentration camp," "dressmaking," "gardens of Babylon." When used with the psychogalvanometer, the subject does not usually answer with words, but his uncontrollable reactions to word stimulus in terms of more rapid pulse and breathing and increased blood pressure are recorded and interpreted by the observer

Sentence completion tests. These are almost always written. An ambiguous statement beginning a sentence and referring to the subject or to another person is set down and the counselee completes it. For example, it may start "What I most want out of life is . . . " and be followed by "The one man I have most hated was . . . " or "My best friend blew up when . . . "

The OSS staff,[18] after trying out a number of projective devices, found this type most useful and finally employed it to the virtual exclusion of other forms. One reason was that it seemed much easier to interpret the significance of

[18] OSS Assessment Staff, *op cit*, pp. 71–75.

longer statements than single words. Careful preparation of the unfinished sentences can tap almost any areas of personality wished for, such as the twelve listed in the OSS reference and others. Those that result in unique or largely different answers from student to student are kept as good, and those that result in repetitive stereotyped answers are discarded. Like other projective instruments, the sentence completion is not scored but interpreted and its effectiveness and validity depend on the insight and experience of the counselor and on the interpretations being checked against the results of the interview and other tools of counseling.

Thematic apperception tests. These are usually a series of ambiguous photographs or drawings which the counselee studies briefly and then interprets to the counselor orally or in writing. For example, given a page showing ten small photographs of college students, the counselee may be asked to tell which of them he thinks are "bright" and which "dumb" and why, or which are Jewish and which gentile and why. Or he may be given a drawing of a battered ship plowing through a stormy sea, or of a child sprawled on the floor and a woman bending over her, the latter so posed that she may either be imagined to have knocked the youngster flat or to be about to help her up and comfort her. The subject is then asked to interpret what is happening. As he does so, he is bound to project into his description his own feelings about the sea or about mother-child relationships.

The Rorschach ink-blot test. Nearly everyone has looked at clouds in the sky, at rock and tree forms, and at reflections in the water and exclaimed "That looks like a castle" or a fish, or a fat old woman. When we have done so we have projected, often our inmost hidden desires and fears, into these natural forms. Many of us, as children, have had fun putting a drop of black or colored ink on a piece of paper and then folding or crumpling the sheet to spread the ink blot into forms sometimes familiar, sometimes strange and

weird Rorschach, using this process, has developed a series of ink blots, has standardized them, and, with his associates, worked over a period of years, administering them to normal, neurotic, and psychotic people By patient experiment he has moved toward standardization of interpretation of the results of what people imagine when they study these blots. Hence, one thoroughly trained in this technique can make tentative diagnoses of a counselee's personality structure and of the causes of his difficulties that are fairly reliable.

Observed free play. In employing this projective device, a child is put in a room with such toys as a mother doll, a father doll, a brother and sister doll. His behavior at play with these objects is watched by a clinician through a one-way screen. If he tries, as frequently happens, to destroy one of them by strangling, punching, or tearing apart, he can be assumed to be demonstrating a conflict with one or another of his parents or siblings which he has to suppress at home. On the contrary he may, by reverse of this behavior, by fondling, petting, and kissing the doll image, indicate overaffection or dependence, etc. Similarly, observations may be made of child and group reaction when two or more are let loose in the playroom together.

The psychodrama or role playing. This projective device, as an instrument for the study of personality factors, is comparatively new and promising. Basically this tool derives from the long history of man's pleasure in acting, of playing out on a stage his own or others' imaginings and dreams of conflicts, struggle, and heroism, thus projecting his idealizations, his loves, his hatreds into the character that struts the boards. It is related to the free play of children, as they try to behave like Marine snipers, flyers, mamas and papas, or builders of dams and castles. While high school and college students and adults are much more inhibited than children by self-consciousness induced by social mores, if they can be brought to feel that "it doesn't matter because we are, after all, only playing a part," they will reveal many of their most deeply hidden passions,

prejudices, and troubles when they "throw themselves into a role." This appears specially true if they are given only the bare outline of a simple plot and all the acting, the stage business, and the lines they speak are quite impromptu. The effectiveness of psychodrama or role playing is found to be increased if the part to be acted out is the reverse of the usual daily life pattern of behavior. For example, if a student imitates the character of a teacher, dean, principal, or president, or if a labor leader tries for a while to pretend he is a business executive and vice versa, each demonstrates, in sometimes startling ways, his attitudes, rigidities, and emotions which he may have previously suppressed and obscured even from himself An observer trained in psychology can school himself to interpret behavior in this setting and to widen and deepen his insight. Not often can a counselor himself create and produce psychodramas, but he may, if he knows how, draw important information about his counselees from role plays put on by departments of speech, drama, psychology, or education. This device was used with extraordinary effectiveness by the OSS staff in assessing its candidates,[19] and their report seems to the authors to give many leads to future experiments in educational and vocational counseling.

Rating Scales

The rating scale is an instrument so widely used that there appears to be little need for a description of it here other than to say that it is a written formalization of subjective judgment, an attempt to put on paper a word like "morale" or a phrase like "selection of occupation" and follow this with a 3 to 10 point series of categories, such as *good, mediocre, bad,* or *very poor, poor, fair, good, excellent,* and then ask one or more people to peg down, by a check mark, their judgments of a counselee.

[19] See especially *op cit*, pp. 91–112, 133–138, 147–159, 168–177, 189–197.

Important to our purpose is the fact that many users of rating scales are not aware of the kinds of errors which creep into the recorded judgments of even the most skillful raters and that multiply in those of untrained ones. Among these are the errors of

Leniency, an impulse on the part of many raters to be overgenerous in their appraisals, to feel that they do not want to limit another human being's opportunities by expressing unfavorable opinions of him. Sometimes this arises because the raters are themselves warmly optimistic. Sometimes it comes from their own insecurity and fear of a kick-back, as in the Biblical adage, "Judge not, that ye be not judged." Sometimes, as in the armed services, leniency is forced upon raters by a system of scheduled fitness reports; in this system, if the estimates are even mildly condemnatory, the consequences are severe for both the raters and the rated, entailing full written reports, hearings, and occasionally courts martial. A counselor using rating scales is, for these reasons, compelled to make a judgment in each case as to whether he should discount the favorable ratings and if so, by how much Less frequently this pattern is reversed and we find grim, tough, pessimistic raters who almost invariably make negative appraisals.

Central tendency, a common habit of some raters to assume that very few people are either wholly lacking in, or possess a high degree of, the qualities being appraised and who therefore tend to bunch all their judgments around the middle of whatever scale they are using.

Faulty logic is an error committed by some raters who argue that since student A looks and acts much like student B, therefore B should be rated in the same way as A.

Halo is the mistake of assuming that "nothing succeeds like success" or fails like failure. In this, for example, the rater knows that a student once cheated and assumes, therefore, that he will always cheat Or he knows that the young man did a superb job in his course and concludes that he must be a brilliant student in all subjects.

In contrast to these basic errors, the following generalizations regarding rating scales are based on research evidence which gives them some validity:

1. Two ratings by the same judge are no more valid than one.

2. Self-ratings tend to be high on desirable traits and to be low on undesirable ones.

3. One tends to rate his own sex higher than the opposite sex on desirable traits, the reverse being true on undesirable traits.

4. Men are more lenient in their ratings than women

5. In self-ratings, superior individuals underestimate themselves and inferior individuals overrate themselves, the latter having the greater error.

6. Parents overrate their children as a rule, but they underestimate superior children.

As can readily be seen from this brief review of some of the errors and fallacies in rating, reliability of scales varies with the traits being judged, with the experience of the raters, with the purpose of the ratings, and with the conditions under which they are made. Even so, rating scales are often the best available instruments for collecting certain types of information for counseling, and we must use them provided we are consistently cautious in checking their reliability. The reliabilities of ratings reported in the literature tend to run between correlations of from .40 to .60. Under special conditions they may go higher.

The question of validity of rating scales is also a difficult one. The necessary outside criteria against which to measure their validity are hard come by. When we find such criteria, we must ask whether they are any more valid than the scale being judged Both the trait being judged and our criteria for validating it are often highly complex. Suppose, for example, we are attempting to rate a student on his "ability to get along with others." We have to determine what we mean by "get along with" and define "others." Does "get along with" mean just tolerance, slavish "yessing,"

or intelligent adaptability under normal circumstances, or does it include easy adjustment in situations of crisis and extreme social stress? Does "others" mean everybody, children and oldsters, male and female, crooks and saints, or do we limit "others" to certain kinds of persons? Because of this complexity most studies of rating-scale validity indicate a ceiling represented by an r of .60 and usually the correlation with a criterion or criteria is markedly lower than this. The counselor can put trust in the results of rating scales only if he knows the raters well and if, in addition, he uses other tools as crosschecks. The rating scale used alone is a weak and inefficient counseling device

Occupational Information

One of the earliest modern tools to be widely used by educational-vocational counselors was occupational information. Because so few valid and reliable tools were available to the applied psychologist prior to 1920, occupational information was then employed in ways that now seem primitive and often silly. *Man analysis* was still in an infantile stage when *job analysis* had reached its adolescence. Among other things, this lag caused our former sharp, artificial division of counselors into "vocational counselors" and "clinical counselors." We did not yet realize that one relatively untrained in psychological tools and techniques should not attempt the complicated task of matching individuals (man analysis) with occupational outlets (job analysis). We did not yet see that a person trained as a "pure" psychologist, chiefly with rats, guinea pigs, and dogs as his subjects, should not attempt educational-vocational counseling of human youngsters without extensive additional preparation in personality analysis and studies of the world of work The amount and kind of occupational information necessary to enable these psychologically trained counselors to work with educational-

vocational problems was long debated. One school of thought insisted upon their acquiring detailed knowledge of a large number of different occupations, spending much time and effort on keeping this type of information current, and gearing this knowledge into an equally detailed study of educational preparation for all the multitude of tasks by which men earn their livings. Another school held that other methods would be more fruitful, since it would leave time for the counselor to perform his major function of working with individuals. This latter point of view has become dominant, and with it we shall be chiefly concerned

The first position taken is that counseling is so complex as to field and level that no one person can begin to master all of it and that, therefore, it must be divided among various professional workers. When this principle is applied to occupational information, current and applicable to local and regional conditions, it is clear that the staff members of the United States Employment Service, workers in each of the state employment offices, and personnel people in major industries are the specialists who now gather, analyze, and distribute most of the pertinent material needed by counselors. While much still needs to be done, the nation and the world over, to improve and coordinate both job analysis and job forecasting, it is clear that this work is not that of the educational-vocational counselor Instead it is his task to make himself thoroughly familiar with all available sources of vocational information, to demand that they increase and perfect their services, and to declare his specific needs for such materials. The counselor, then, should train himself to keep informed about and to use:

1. The various methods of classifying occupations, including the United States Census classification; the *Dictionary of Occupational Titles;* the several hierarchies of job classification by a single academic intelligence criterion, with the Barr-Taussig Scale as the prototype, the classifications growing out of the theory of mental organization

typified by the work of T. L. Kelly, L. L. Thurstone, and the Minnesota Occupational Rating Scales; and the classifications arising from factor analysis of measured interests, following the work of Strong, Kuder, and Darley.

2. *The job-family approach,* which has been an increasingly important concept because of its recognition of human multipotentiality and of similarity in job functions and processes. Counselors must be in a position to identify the brothers, sisters, aunts, and cousins of specific job labels and trace this kinship through aptitudes, abilities, and interests essentially common to a number of occupations whose *names* give no indication of any such relationship.

3. *The critical analyses of occupational trends,* by which are swept aside the clutter of irrelevant facts which accompany so much of our material in the field of job description. For example, much of the information about a job supplied by writers of pamphlets and monographs tends to be no more than a factual recitation of such information as the number of workers in a field, the salaries or wages which they draw, and the shift in numbers from one census to another. Careful analysis of the first of these may clarify our point We ask, "What difference does it make whether there are 1,000,000 workers in the field or 2,500?" Critical study may show that the occupation with the large number may need twice as many workers, or half as many, in the next decade. The occupation with the smaller number may be the last remnant of a rapidly dying type of work, or the first group of employees in a field that will expand hugely. A report that an occupation is filled may be true on a national basis but false in a given region or small locality. Interpretation of job statistics seldom takes into consideration the probability that many jobs are threshold ones and that the workers now employed in them will not stay but tend to move on up. Only when job families are clearly understood can counselors know that when clerical workers are walking the streets in search of work, their clerical skills *coupled with other skills* may open employment to most of them.

4. *The understanding of social forces* which bend employment trends in various directions. Too few counselors watch the labor-management struggle which leads to changing labor legislation and to shifting union policies on apprenticeship and hiring. Not enough counselors read of science, invention, and their resultant technological changes, in process or impending, nor do they study the probable impact of national and international political and economic moves. In our complex world, even the best of counselors can see only a portion of the action of these powerful forces and can predict their effects only a short way ahead, but it is essential that he do all he can to read the road signs set up by specialists in economics, political science, sociology, and education, rather than to try to become himself a specialist in any one of them.

Disseminating Occupational Information

It appeared reasonable, when counseling was young, that young men and women would surely make sounder educational-vocational decisions if only they were better grounded in the facts of the world of work At first glance this appears to be a logical assumption on the principle that we cannot perform effectively without knowledge But this ignores the corollary principle that possession of knowledge is only one element in the power to do things. One may know a vast amount about opera and still not be able to carry a tune. Many teachers of business administration cannot practice what they preach and make fortunes. This was forgotten when the first courses in occupational information were established in the naive hope that they would do the trick. When it was found that such courses were not enough, counselors and teachers, cooperating with school and college librarians, tried a number of supplementary methods for the purpose of placing accurate job information in the hands of those deemed to need it. Little sound research was developed to determine the efficacy of either courses or vocational libraries. Such early studies as were

made, for the most part, showed only that those who had had a course or read books and pamphlets about occupations could reproduce more information on an examination based on the course or book than could an individual who had not taken the course or read the materials. Many falsely concluded from these results that, since students now had better, or more, information about occupations, their career choices would be superior to those with less formal information. They did not see the fallacy in this line of thought which may be clear if we make the same assumptions about health education. If we were to administer examinations to students who have had a course and readings about health, and then administer the same examinations to a matched group of convalescents in sanitaria or hospitals for various long serious illnesses such as tuberculosis, we would probably find that those with the highest scores were those with the poorest health!

A second criticism of the traditional techniques of disseminating occupational information is the tendency for school and public libraries to accumulate bound books about various occupations. These are almost always "dated" in terms of the conditions prevailing at the time they were written. A review of any such volume, say Pitkin's *New Careers for Youth,* published in 1934, will demonstrate how outmoded it becomes, sometimes almost before it is off the press. His chapter on nursing as a career was written without any anticipation of the coming war, of how that conflict would increase enormously the demand for nurses, and of how it would extend the types of training and services required. The bound book on occupations should usually be consigned to the yearly bonfire every counselor should light to destroy obsolete and erroneous materials. If it is left embalmed in the library, it tends to increase the errors of both counselors and counselees as it becomes more and more outmoded.

Another fault of both books and the more practical, because ephemeral, pamphlet materials, is that they tend to be highly specific about jobs. Relatively few such publications

are based upon any concept of field-level* choices and the functionally related occupational families which arise from such concepts. The difficulty with specificity is that the individual, seeking to attain balance in his educational-vocational planning, is plunged into details before he is oriented to the general hypotheses underlying his alternative choices of a career. A job description of what a lathe operator does usually lacks appropriate materials describing numerous related jobs requiring quite similar aptitudes, abilities, interests, training period, union affiliation, and a dozen other more or less important variables. The work of the lathe operator appears in isolation, ignoring the multipotentiality of the average human to perform, successfully and with satisfaction, the duties in perhaps as many as a thousand jobs with different names

These early faults in occupational materials have been partly overcome, and the materials are now fairly adequate and are constantly improving It is in our methods of using them that we still make our most grievous blunders The first common mistake in method is failure to set clear, achievable objectives for group programs aimed at the dissemination of occupational information. Too frequently we still assume that our objective is improved educational-vocational choice which is a goal that can be reached only by intensive individual counseling to which group methods may make some contribution. If the group method consists primarily of "talking at" students about jobs, it is even less likely that we shall attain this objective The authors know of not one study reported in the literature which gives us any reason to believe that the talking-at-groups technique by itself gives results better than chance in improving educational-vocational choices for its victims

This is not to say that such courses, dealing with the seamless web of the economic life of man, have no value. On the contrary, social science studies of jobs and workers, of their dependence upon one another, and of such basic principles

* The field-level concept is discussed in detail in Chap 3.

as supply and demand for human labor are essential to the general education of American high school and college youth. Through these curriculums he may learn how mechanics and engineers, farmers and foresters, managers and salesmen, secretaries and officials, doctors and teachers, all depend for successful employment upon each other. With this objective for teaching occupational information, trips to farms, industrial plants, and business offices; showing movies of mining, sculpturing, and dressmaking; and lectures, readings, and discussion have rich meaning in demonstrating the dynamic structure and operation of society. But there is no evidence that such schooling has any but the most incidental and casual effect in helping its students to make individual wise choices of the work they should do.

Of similar futility, unless they are undergirded by intensive individual counseling, are the widely used techniques of "career days," "one-shot" vocational conferences, and interviews with local workers. The fundamental fault in each of these is that too much is attempted in too short a time Each is based on the illusion that choosing a career is an *event* of a single hour instead of a *process* of years of growth and learning. One or two career days out of a school year, set aside for the discussion of the vast complex of job fields and levels with a whole college freshman or high school senior class, cannot be anything but confusing and superficial no matter how well it may be organized Many schools and colleges have tried one-shot conferences. For this they employ a "vocational guidance expert" for a day or a week and run the class through his hands individually, allowing perhaps ten minutes, at most half an hour, for each conference. In such a lick-and-a-promise scheme, the results are more often than not highly directive and usually tend either to confirm wrong choices or to throw the student off what seemed to him a sound track into bewilderment. As for single interviews instead of a series of interviews with local workers, these also are more frequently ineffective than not Often men and women invited by the

administration to describe their jobs to students are professional people in law, medicine, nursing, engineering, etc., and the 80 per cent or so of the students who will not carry through any professional training are either left out or are persuaded to try a field and level beyond their abilities and outside their interests, with inevitable frustrations as a consequence. Moreover, the majority of workers in other fields than education are unskilled in teaching, do not know how to organize and present the structure, requirements, hazards, and rewards of the work they do. Some get bogged down in detail. Some have nothing to offer but glittering generalities. Some are overenthusiastic and oversell their professions, while others are lugubrious and discouraging about theirs In view of these common failings, administrators and counselors planning to use any of them would do well to make sure they are used merely as minor auxiliary services to individual counseling and that they are organized so as to produce such small benefits as they are able to produce and to avoid as much confusion and harm to the students as they frequently have in the past. Stone's[20] crucial study suggests that if these principles are observed and these techniques used cautiously as supplements to intensive one-to-one counseling, the reliability and validity of the application of occupational information as a counseling tool may be much increased.

A Systematic Approach to Using Occupational Information

It is obvious that no one can make a blueprint for disseminating occupational information which will fit all situations. The experience of the writers, however, supports Stone's conclusion that this tool is most effective when used in conjunction with other psychological instruments of the clinical counselor. Therefore, certain general principles are presented here with the knowledge that they may not find favor with the traditional vocational counselor or be par-

[20] Stone, C. Harold "Are vocational orientation courses worth their salt?" *Educational and Psychological Measurement*, 1948, 2.161–182.

ticularly useful to the college subject-matter teachers or high school homeroom teachers with little or no training in clinical aspects of psychology. These principles are not intended to apply to the social science courses discussed above, but only to the group teaching of job information as an aid to *individuals* in making better educational-vocational choices.

1. *A group orientation program should be designed only as a prelude to individual counseling* for the purpose of choosing an *occupational field and level* This program may be most successful if it aims at creating a general understanding of human aptitudes, abilities, interests, and motivations and of the process of matching these to fields and levels of occupations The concept of the multi-potentiality of any individual, and an introduction to the various methods of comparing oneself with various norm groups in which competition may take place, should play an important part in the materials presented. It is essential to break down the all too common notion that "Somewhere in this world, if I could only find it, is just one job that is right for me, just one in which I can be a success."

2. *As the orientation program gets under way, a case history folder should be assembled for each member of the group.* This folder should contain both a longitudinal and a current cross-section picture of each individual as suggested in earlier sections of this chapter.

3. *Tentative choices of field and level of major interest should be made,* and these should be discussed privately with the counselor while the group program is in operation. For example, the counselee who early decides that he or she belongs in a scientific-mechanical field at the professional level need not wait for the group program to end before beginning a study of the various occupational outlets in this job family. Investigation of training opportunities, occupational trends, and specific interests may well be started at any time that he is motivated sufficiently to begin a serious study of his problem.

4. *Areas within a field and at an appropriate level should be narrowed down* to permit more specific planning At what point this process should be started depends upon timing For a student who will be leaving school or college in a few weeks, educational-vocational decisions are much more pressing than for an equally able person who has months or years of schooling ahead of him. In most college training the student who takes ample time to reach final vocational decisions may be in a much better position than the one who decides early. In fact, it is doubtful practice for a high school counselor to insist that precollege students make a definite choice. For them, time, thought, new educational experiences, and the college counseling program are likely to ripen and perfect their powers of final decision.

5 *Choices of vocational thresholds rather than finalities should be encouraged* This principle is important because occupational choices made in adolescent or early adult years are seldom predictive of the level ultimately reached in middle age The boy who decides to be a carpenter may find his adult ceiling as a construction engineer, with or without benefit of degree The girl who chooses a career in the field of personal services, say as a beautician, may find her niche in maturity as a businesswoman running a chain of beauty parlors, even though her threshold choice is as an operator. In reverse, when professional levels are chosen, a boy who selects law may find himself no more than a routine clerk or a law librarian years after training is complete. Again he may find that his eventual work is much more closely related to another specialty, such as writing detective fiction, operating as a G-man, or working as an accountant, than it is to the stereotypes of the legal field.

6. *Instructional methods should be far more flexible than those of the traditional classroom.* It is obvious from the foregoing that what is urged is a position between that of the formal teacher-class situation and the one-to-one prac-

tices of the counselor, with both working reciprocally. One need not, then, wholly discard other techniques of group instruction in occupational information, such as readings, preparation of papers on selected job fields, trips, career days, lectures, movies, and interviews with local individuals employed in various types of occupations Each of these techniques can supplement the counseling series of interviews, independent investigation of local and regional training and employment outlets, planned use of the community as a laboratory,[21] and special methods for increasing self-understanding.

To attain further insight into the inadequate validity and reliability of past and present techniques for disseminating occupational information as an instrument for helping individuals make sound educational-vocational choices, we suggest a review of Williamson's discussion of *fallacies* in his book, *Students and Occupations*.[22] Much further rigorous research needs to be directed upon this problem In general, it is clear that most administrators, teachers, and counselors have considered occupational information as merely another area of subject matter to be treated in the same manner as history, English, and algebra. Their stated objectives have seldom been put to the test and their methods have for the most part appeared to be as ineffective as would be medical diagnosis of groups, guidance of groups, and "group courtship"—mutually exclusive terms, unthinkingly accepted.*

STATISTICS

Because the general clinical counselor is an applied psychologist, interested in human behavior and its prediction,

[21] Hahn, Milton E., and Brayfield, Arthur H *Occupational Laboratory Manual* Chicago. Science Research Associates, 1945

[22] Williamson, E G *Students and Occupations.* New York Henry Holt and Company, Inc , 1937.

* The reader will discover some excellent ideas on this subject in Hoppock, Robert *Group Guidance.* New York· McGraw-Hill Book Company, Inc , 1949.

statistics are a tool of prime importance to his work. It is obviously impossible here to present a fair summary of the principles and techniques of statistics for the counselor, The writers take the position that one cannot use other counseling tools such as rating scales, standardized tests, projective devices, or sociometric measures, unless he has more than a simple understanding of the quantitative treatment of psychological data.

The statistical field is already highly complex. Moreover, new methods and formulas, new and revised principles are continually appearing in current literature with which the counselor must keep abreast The competent counselor must unceasingly follow statistical research pertinent to his field in the same manner as does a physician or a physicist. If he is not to fall behind professionally, his reading may concentrate in the following suggested journals.

The *Psychological Bulletin.* Lyle H Lanier, editor. American Psychological Association, Inc., Washington, D C

The *Journal of Abnormal and Social Psychology.* Gordon W. Allport, editor American Psychological Association, Inc, Washington, D C

Psychological Abstracts. C. M. Louttit, editor. American Psychological Association, Inc, Washington, D C.

The *Journal of Applied Psychology* Donald G Paterson, editor. American Psychological Association, Inc., Washington, D C

Applied Psychology Monographs. Herbert S. Conrad, editor. American Psychological Association, Inc, Washington, D C

The Journal of Consulting Psychology. Laurence F. Shaffer, editor. American Psychological Association, Inc., Washington, D.C.

Educational and Psychological Measurement. G Frederick Kuder, editor. Box 6907, College Station, Durham, N C

The *Journal of Clinical Psychology.* Frederick C Thorne, editor Medical College, University of Vermont

The American Psychologist Dael Wolfle, editor. American Psychological Association, Inc, Washington, D C

To be able to read, understand, and apply the materials in these and other journals the clinical counselor must master a new and important technical vocabulary, a new foreign language in English, including the meanings of such terms as

Fiducial limits
Significance of a difference
Residual variance
Multiple regression coefficient
Covariance
Universe
F ratio
Contingency
Chi square values
Nonlinear relationships
Solution of Beta coefficients
Parameter

He must also build into his comprehension many statistical symbols that puzzle the uninitiated, for these symbols are the shorthand for stating the procedures and results of psychological research. If such symbols as the following are not understood, much of the meaning is lost.

r_∞
ϕ
C
R
X^2
σ
σ^2
"t"

It is not enough, therefore, that the counselor have a single course in elementary statistics in his undergraduate or early graduate program. Even the addition of an intermediate course in computing various statistics does not adequately prepare him. Perhaps the answer lies in developing a course or courses entirely devoted to reading and interpreting current literature in statistical research, and in continuous applying, under supervision, during internship and in staff conferences.

A further problem is posed for the counselor who not only must function in working up case histories and interviewing several hundred cases, but who is also assigned responsibility for conducting research There appears to be an increasing tendency for this research function to be allocated

to counselors in educational institutions. Those in business and industrial institutions are also often expected to aid in, or direct, research programs. When this is the case, the counselor must become relatively sophisticated in the common statistical procedures, including the design of experiments, sampling procedures, and small-sample statistics. Whether this knowledge is acquired by informal study, or through formal course work, he must attain competence if he is to hold on to his job.

It is certain, then, that the counselor who makes use of any results obtained from standardized psychological tests must understand the statistics upon which they are based He must have a general understanding of statistical procedure and interpretation and a specific knowledge of the statistics used to validate specific instruments. The counselor who buys and uses tests without such understanding treads upon dangerous ground and may do irreparable damage to the very students he would help by false and misleading interpretations or ruin his own career by making stupid errors in research projects under his direction.

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Chapter 6. APTITUDES, ABILITIES, SKILLS, AND ACHIEVEMENTS

Many terms used in the literature of educational-vocational counseling serve to label important theoretical and practical concepts useful in all phases of analysis, case study, diagnosis, and recommendations Each counselor needs to come to grips with these, to clarify their meanings to himself, and to reach understanding of them with his counselees, if his counseling is to be smooth and effective. Many of the difficulties met arise from loose usage and unsemantic confusion. Such confusion is common among four of the most widely used terms: *aptitudes, abilities, skills,* and *achievements* Each refers to patterns of human behavior pertinent to both school and work activities, patterns which have been identified logically, clinically, or experimentally as in greater or lesser degree different from one another. Since all four are related and sometimes appear to overlap, it seems necessary to attempt, first, to make clear the differences in concept and meaning, and, second, to discuss some examples of each most useful in this type of counseling.

Aptitudes are correctly referred to as latent, potential, undeveloped capacities to acquire abilities and skills and to demonstrate achievements. A counselor, studying several cases, may find by tests that each one has an unusually swift and accurate coordination of eye, brain, and hands This he calls an aptitude for acquiring abilities and skills, and for achievement in a variety of occupations which demand such coordination, but none of the cases has as yet had any instruction or training in any such occupation. In one case, by tests, he identifies another aptitude, that of

being able to distinguish minute differences in the order and arrangement of letters and numbers He can then predict that, with learning and practice, this student can acquire understanding of clerical work and skills in typing, stenography, and filing, the combination being clerical ability. As training and practice in this field continue, and after the student is employed at a clerical task, he accumulates a series of achievements. He gets better jobs He wins higher pay. In a second case, similar aptitude for neuromuscular coordination combines with other aptitudes, as yet untapped, in dealing with music. Routing himself into schooling and employment in this field, the counselee acquires the knowledge and skills to demonstrate ability and achieve success as pianist, violinist, or bassoon player A third student, combining diagnosed aptitudes for eye, brain, hand coordination with an already demonstrated *ability* in scholastic work and *achievement* in biology courses —where he had straight A grades—acquires the abilities and *skills* in medical school to perform highly specialized surgery.

Bingham[1] has clarified the concepts of aptitude and ability and skill. He says:

> "Aptitude" is defined in Warren's *Dictionary* as "a condition or set of characteristics regarded as symptomatic of an individual's ability to acquire with training some (usually specified) knowledge, skill, or set of responses such as the ability to speak a language, to produce music, etc" In referring to a person's aptitude for mathematics, or art, or carpentry, or law, we are looking to the future. His aptitude is, however, a present condition, a pattern of traits, deemed to be indicative of his potentialities.

It must be noted here that people do not possess clear-cut aptitudes, easily identified, and subject to exact measurement although they may be roughly approximated by a highly trained counselor. Most of the aptitudes and abili-

[1] Bingham, Walter Van Dyke *Aptitudes and Aptitude Testing.* New York: Harper & Brothers, Pp. 16*ff*.

ties which counselors label for convenience in counseling, such as mathematical ability or clerical or artistic aptitudes, must be considered in somewhat the same light that Allport[2] treats common traits. Although the patterns of behavior identified as mechanical aptitude or ability are common in general to all men except those who are paralyzed —we all can walk, run, step, bend, use our muscle systems and our hands—there are unique personalized aspects of the aptitude or ability in range, kind, and degree which are not contained in any general definition or description of mechanical aptitude or ability as a common human trait, as illustrated in the cases of the typist, musician, and surgeon. The mechanical ability of John Doe is never the same as that of Henry Roe even though the similarities appear great.

Bingham[3] is in agreement with Allport when he discusses the theory of aptitude and assumes that it encompasses

1. The intraindividual differences which underlie the relative strengths and weaknesses of an individual when we compare his better with his poorer aptitudes and abilities
2. The interindividual differences which become apparent when we compare one person with another, or one person with a group of others in terms of selected aptitudes or abilities
3. The relative stability of these inter- and intraindividual differences. A further corollary of these postulates is the fact that we can estimate, judge, or measure aptitudes and abilities with a fair degree of accuracy.

Aptitudes are, of course, not limited to motor activities but cover all social, educational, and vocational patterns of human activities. They are made up of many dynamic elements, such as application of attention, persistence, and

[2] Allport, Gordon W. *Personality A Psychological Interpretation.* New York Henry Holt and Company, Inc., 1937 Pp. 297–303.

[3] Bingham, *op cit*, pp 24–33.

effort and interests, attitudes, and motivations. Counselors are familiar with the educational-vocational problems which confront counselees who may have the aptitudes, abilities, and skills to perform the duties of an occupation but who, for lack of interest or driving motivation, will not study or do sustained work in it at all or except by fits and starts. Attitudes also determine in large measure whether or not students will work to develop aptitudes into abilities and abilities into achievements. For example, his attitudes toward our socio-economic order will inevitably determine whether a counselee's aptitude, say for banking, will be fashioned into a lifelong career in that occupation or instead will block off this development and route him to work with the Communist party. An individual possessed of great potentialities may fail to realize promise in any of them if an appropriate level of motivation is not present. These interest-attitude-motivation aspects of aptitude will be more fully treated in a later chapter. We call attention to them at this point to avoid giving the impression that aptitudes and abilities are concerned only with mental organization and motor skills.

Again we quote Bingham.[4]

> The meaning of "ability" which occurs in the definition of aptitude, itself calls for comment. *Ability* means power to perform responsive acts. These acts may be complex coordinated movements, solutions of intellectual problems, discriminating judgments of appreciation, or other sorts of behavior—as, for instance, the maintenance of coolness and self-restraint under conditions of provocation or emergency. The amount of a person's ability in a given direction is ordinarily expressed in terms of difficulty or complexity of the tasks he can perform, the number he can perform at specified levels of difficulty, or the speed and precision of his performance

The counselor's problem in estimating, judging, and measuring aptitudes and abilities demands both quantita-

[4] Bingham, *op. cit.*, p 19.

tive and qualitative analysis. He is under the necessity of both utilizing the terms of subjective evaluation, such as *good, poor, bright,* or *dull,* and employing quantitative statistical labels, such as standard scores, percentiles, means, or medians The combination of experimental and clinical evidence is essential to sound judgment. Many of the counselor's tools, discussed in Chaps 4 and 5, are thus adapted to aid in the making of judgments of quantity and quality of aptitudes, abilities, skills, and achievements.

Common Aptitudes and Abilities

In counseling, as in other clinical fields, it is necessary to categorize items and subitems of information about jobs and workers, schools and students, for purposes of clarity and systematic treatment This is particularly true when we deal with such complexities as aptitudes and abilities It is probable that each of the more than 40,000 named occupations in the United States has certain major or minor characteristics that mark it off from all others. Since it is quite impossible for any counselor to comprehend this vast multitude of detailed differences, the concept of job families has been developed to group occupations which are closely related in terms of the aptitudes and abilities necessary for their successful performance. Only by this process does this mass of material yield itself to understanding and practical application. Upon analysis, it is found that these job families can be described in relation to occupational aptitude, ability, skill, and interest patterns. These patterns are then labeled in order to permit general identification and manipulation of the concepts.[5] Table 1 presents

[5] The reader who wishes to study the developmental history of occupational ability patterns is referred to the following sources

Cisney, H. N. *Classification of Occupations in Terms of Social Intelligence, Artistic Ability, and Musical Talent* M. A. thesis on file in the University of Minnesota Library, 1935.

Fryer, Douglas "Occupational intelligence standards," *School and*

four tentative systematic approaches to occupational aptitude and ability patterns found useful in counseling. The reader will note that the trait or occupational area names and their definitions and descriptions are exceedingly broad. If the relatively different labels are combined from these several classifications, we may obtain some such outline as the following:

1. *Academic, scholastic, or verbal.* This is defined and described, usually unsatisfactorily, in terms of "general" intelligence. While it may be administratively useful in colleges and high schools to assume a "general" intelligence—an aptitude that will permit or not permit a given student

Society, 1922, 16 273–277.

Fryer, D., and Sparling, E. J. "Intelligence and occupational adjustment," *Occupations,* 1934, 12.55–63

Goodenough, F L., and Anderson, J. E. *Experimental Child Study* New York Appleton-Century-Crofts, Inc, 1931. Pp 501–512

Oakley, C A, Macrae, A, and Mercer, E O *Handbook of Vocational Guidance.* London University of London Press, 1937. Pp. 365–380

Paterson, Donald G, and Darley, John G *Men, Women, and Jobs* Minneapolis: University of Minnesota Press, 1936

Paterson, Donald G, Elliott, Richard M, *et al* *Minnesota Mechanical Ability Tests* Minneapolis University of Minnesota Press, 1930 Pp. 136–140.

Paterson, Donald G., Gerken, Clayton d'A, and Hahn, Milton E *Minnesota Occupational Rating Scales* Chicago. Science Research Associates, 1941.

Stead, William H, Shartle, Carroll L., *et al* *Occupational Counseling Techniques.* New York American Book Company, 1940 Pp. 175–206.

Taussig, W. F. *Principles of Economics.* New York The Macmillan Company, 1912 Vol. II, pp. 134–148

Terman, L. M *Genetic Studies of Genius* Stanford University, Calif. Stanford University Press, 1925 Vol I, pp 66–69

Trabue, M R "Functional classification of occupations," *Occupations,* 1936, 15 127–131.

Yerkes, Robert M "Psychological Examining in the United States Army," *Memoirs of the National Academy of Sciences,* Vol XV. Washington, D.C Government Printing Office, 1921 Part III, Chap. 15, pp. 819–837

to do all of the required work at a passing level or better—such an assumption is not so useful to the counselor who must inquire as to what more specific academic abilities, such as mathematical, literary, scientific, etc., his counselee possesses or does not possess. Hence, several of those following are frequently included under this too broad category.

2. *Numerical and mathematical.* The mental manipulation of numbers, of algebraic, geometric, and trigonometric symbols and relations of cause and effect treated through numerical concepts.

3 *Spatial* Problem solving involves both two-dimensional designs on a flat plane and actual objects in three-dimensional space, and the geometric forms which represent such objects, as in engineering, the plastic and graphic arts, pattern making, etc

4 *Scientific.* The application of inductive and deductive reasoning to facts, principles, laws, and constructs, to relationships, and to the systematic objective verification of hypotheses.

5 *Mechanical.* The manipulation of objects to achieve desired practical results and, at the professional level, the manipulation of the symbols representing the objects, their relationship, and their movement in time-space as in engineering, surgery, piloting ships or airplanes, etc

6 *Manual skills.* The eye-hand-tool, eye-hand, and more gross wrist-hand, forearm-wrist-hand, and general bodily coordinations which permit finely coordinated acts in manipulating objects of the physical world. Employed in a wide range of occupations from carpentry to surgery, from knitting to playing piano or violin, from driving a car to flying a supersonic plane.

7. *Physical agility* The general coordination of bodily movement, or of different neuromuscular systems, including the fine and the gross, which make some individuals better performers in certain occupations requiring such coordinations than in others. It is to be noted, however, that few

TABLE 1 CLASSIFICATIONS OF HUMAN APTITUDES AND ABILITIES*

Kelly†	Williamson‡	
Aptitude or ability and description	*Aptitude or ability and description*	*Occupational outlets*
Verbal—Ability to define, understand, and use words as symbols of meaning and experiences	Verbal and linguistic—Fluency in use of one's own language and facility in learning other languages Perception of verbal relations	Author, lawyer, professor, minister, editor, advertising copywriter, etc
Numerical—Ability to manipulate (mentally) numbers as symbols of experience or meaning; to solve problems which involve numbers	Mathematical—Facility with abstract symbols (and relations of cause and effect) Perception of complex number relations	Mathematics teacher, accountant, statistician, engineer, comptroller, etc
Spatial—Ability to think or solve problems (mentally) involving objects and the geometrical forms which represent actual objects in space	Constructive and mechanical—Perception of spatial relations, facility in designing, calculating, working with machinery, etc	Engineer, architect, inventor, toolmaker, printer, etc
Memory for detail	Manual skills—Dexterity in using tools, skill with hands and fingers, precision in coordinating movements	Surgeon, dentist, sculptor, artist, skilled mechanic, special skilled trades, etc
Drill—Routine memorizing or learning	Artistic (inc musical)—Appreciation of form and color, facility in crafts and in imaginative interpretations	Artist, sculptor, architect, designer, composer, actor, dancer, etc
Physical agility—Ability to coordinate large and small muscles, to manipulate objects with speed and precision	Social—Sociability, cooperativeness, tact, personal pleasingness, helpfulness	Politician, teacher, personnel or social welfare worker, salesman, etc
Musical—Ability to understand musical forms and to perform on a musical instrument	Scientific—Facility in defining, classifying, grasping principles, inductive reasoning, perceiving relation of rule to example	Research worker, physician, physicist, chemist, geologist, psychologist, etc
Artistic—Ability to understand form, balance, color harmony, and their use in artistic creation and interpretation	Clerical and commercial—Accuracy and speed in handling numbers, names, systems, and details	Bookkeeper, credit man, purchasing agent, cashier, clerk
Social—Ability to work with people without friction; leadership	Executive—Initiative, self-reliance, ambition, leadership, etc	Director, manager, foreman, inspector, etc
	Practical—Efficiency in practical affairs, calmness under pressure, persistence, courage.	Airplane pilot, sea captain, army officer, surgeon, etc

† Kelly, T L. *Interpretation of Educational Measurements* Yonkers, New York World Book Company, 1927. Pp 124–125

‡ Williamson, E G *Students and Occupations* New York. Henry Holt and Company, Inc, 1937. Pp 31–33

* Compiled by Milton E Hahn, Director, Psychological Services Center, Syracuse University, July, 1946

TABLE 1 (*Continued*)

Paterson-Gerken-Hahn §

Aptitude or ability and description	*Levels*	*Occupational outlets*
Academic—The ability to understand and manage ideas and symbols	Professional, semi-professional, and executive occupations	Lawyers, college presidents, president of a large manufacturing concern, teachers at all levels
	Technical, clerical, supervisory	Minor executive, or highly technical work, railroad clerks, shop foremen, stenographers
	Skilled tradesmen, low-grade clerical	Auto mechanic, stationary engineer, typist
Mechanical—Includes both the ability to manipulate concrete objects—to work with tools and machinery and the materials of the physical world—and the ability to deal mentally with mechanical movements	Professional and higher technological	Inventive mechanical genius, mechanical engineer, toolmaker
	Skilled tradesman, high level	Draftsman, engraver, general automobile mechanic, bricklayer
	Skilled tradesman, low level	Boiler maker, tire repairer, cobbler
	Semi- and unskilled tradesmen	Wrapper, bench assembly worker
Artistic—Refers both to the capacity to create forms of artistic merit and the capacity to recognize the comparative merits of forms already created	Professional	Sculptor, artist, etcher, university art teacher
	Commercial	Magazine illustrator, interior decorator, landscape gardner.
	Crafts and mechanical	Potter, draftsman, weaver
Social—The ability to understand and manage people—to act wisely in human relations	Persuasive—direct or indirect	Politician, life insurance salesman, minister, social service worker
	Administrative	Executives, foreman, lawyer, physician
	Business contact and service	Sales clerk, information clerk, hotel clerk, telephone salesman
Clerical—The ability to do rapidly and accurately detail work such as checking, measuring, classifying, computing, recording, proofreading, and similar activities	Professional and higher technical	Accountant, actuary, statistician, secretary, bank teller
	Technical	Bookkeeper, stenographer, calculating machine operator, railway mail clerk
	Routine	File clerk, mimeograph operator, retail sales clerk, messenger
Musical—The capacity to sense sounds, to image these sounds in reproductive and creative imagination, to be aroused by them emotionally, to be capable of sustained thinking, to give some form of musical expression.	Creative, interpretive, higher professional	Composer, concert artist, symphony soloist, teacher in university.
	Technical, lower professional	Arranger of music, critic, player in dance orchestra
	General and mechanical	Instrument repairman, music store clerk, factory instrument tester.

TABLE I (*Continued*)

Dictionary of Occupational Titles‖

Classification of work¶	*Occupational outlets*
0 Professional and managerial occupations	0–0 0–3 professional 0–4 0–6 semiprofessional 0–7 0–9 managerial and official
1 Clerical and sales occupations	1–0 clerical and kindred 1–4
	1–5 sales and kindred 1–9
2 Service occupations	2–0 domestic service
	2–2 personal service 2–5
	2–6 protective service
	2–8 building service and porters 2–9
3. Agricultural, fishery, forestry, and kindred	3–0 agricultural, horticultural, and kindred 3–4
	3–8 fishery occupations
	3–9 forestry (except logging) hunting, trapping
4 Skilled occupations 5	
6 Semiskilled occupations 7.	
8 Unskilled occupations 9	

§ Paterson, Donald G, Gerken, Clayton d'A, and Hahn, Milton E *The Minnesota Occupational Rating Scales* Chicago Science Research Associates, 1941, Pp 20–26

‖ *Dictionary of Occupational Titles, Part II*, U S Dept Labor & U S Employment Service, Washington, D C U S Government Printing Office, 1939, pp ix ff

¶ The "Classification of work," the *Dictionary of Occupational Titles*, is a compromise between the U.S. Census classifications and human ability classifications.

have this agility as an over-all pattern at high level; *e.g.*, specialization in passing, kicking, tackling, running, and blocking is increasingly evident in modern football.

8. *Artistic* The appreciation, interpretation, creation, and analysis of forms having artistic merit. Again, this is a far too general category for application to sound educational-vocational counseling. A student may have high aptitude or ability in appreciation but be lacking these in interpretation, creation, and critical analysis. Another may be able to create a painting but be a poor art critic, etc Moreover, one may have great talent in sculpture but little in painting or architecture

9. *Musical.* The appreciation, interpretation, creation, or analysis of musical sounds. What has been said concerning the graphic, plastic, and architectural arts as to the multiplicity and complexity of individual talents applies equally here.

10 *Social.* The social effectiveness of the individual in his cultural setting, how he manages to get along with people, teachers, and fellow students in school and college, coworkers and bosses on the job, members of his family, his friends, and persons in the organizations to which he belongs.

11. *Clerical.* The effectiveness of the individual in dealing rapidly and accurately with clerical details at various levels

12. *Executive.* Initiative, self-reliance, and leadership in producing results from activities of self and others.

13 *Practical.* "Horse-sense" efficiency in practical affairs under various conditions of social and physical pressure. This complex concerns not only the making and management of money, but effective dealing with things and people for profit or prestige or both

Inspection of the above list of some "aptitudes" and "abilities" indicates immediately that there is overlapping and that the categories are extremely broad. Nevertheless, if a systematic and meaningful approach is to be made to

educational-vocational problems of individuals, such tools and techniques, however dull and gross they may be, must be used. It is also evident that we can continue to make logical categories of combinations of human abilities into finer units almost indefinitely Oakley, Macrae, and Mercer,[6] for example, deal with twenty-four human abilities and other qualities. Raymond Ward[7] also concerns himself with a large number of variables related to occupational placement. The OSS Assessment Staff[8] advise a somewhat different approach and terminology. They say in part:

> There is some advantage, we believe, in correlating the term "intelligence" with the effectiveness of any system of mental functions and in designating the nature or purpose of each distinguishable system by an appropriate objective, such as aesthetic intelligence, social intelligence, scientific intelligence, administrative intelligence, mechanical intelligence and so forth, and then designating by a suitable term each separable function (mental ability) that is involved in the operation of each system, such as, observational ability, evaluative ability, interpretive ability, conceptual ability, imaginative ability, logical ability, predictive ability, planning ability, manipulative ability and so forth.

Counselors whose chief concern is with general educational-vocational problems of students in educational institutions may not usually have to work with so many categories as any of these indicate. The authors recommend, however, that each counselor continually study the various methods of classification and adapt or create for his own whichever seem most logical and useful to him.

To the clinical counselor in business and industry, where solutions of a large number of placement problems are continually demanded and where the offices and plant are directly under his eye, job analysis into fine ability com-

[6] Oakley, *op. cit.*, pp. 130–137

[7] Ward, Raymond S in Stead, *et al. op cit*, Chap. X, pp. 175–206

[8] OSS Assessment Staff. *Assessment of Men.* New York: Rinehart & Company, Inc., 1948. Pp. 264*ff*

ponents of great number and into composites is important and, frequently, a necessity. The classification of job families by patterns of broad ability categories is essential in many situations in education and business and industry. Because this book is but incidentally concerned with counseling in business and industry, we confine ourselves primarily to classifications most pertinent to talents and activities in school and college and to selecting a career.

Although the general clinical counselor cannot deal with all meaningful variables suggested above, he is forced into the attempt arbitrarily to select those which are practicable and which promise the most effective assistance to his counselees. Of the above list of human abilities which can be combined to yield an occupational profile for individuals, seven discussed on the following pages are selected by the authors as minimal for counseling with those having problems involving educational-vocational choices. These abilities are *academic, mechanical, social, clerical, musical,* and *artistic* By patterning the qualitative and quantitative degrees of these abilities, general analyses of individuals are possible for comparison with job patterns similarly derived. Several of the ability categories omitted from our previous list—*numerical and mathematical, spatial, manual skills*—are here distributed and embedded among academic, scientific, and mechanical abilities. Thurstone's[9] investigation of primary mental abilities is the major justification for this treatment. Manual skills are assigned to physical agility and coordination and to mechanical ability. Executive and practical abilities, while important, are so generalized that they can be assigned broadly to social and academic ability The counselor will, however, find these discarded categories useful and perhaps superior to those

[9] Thurstone, L. L *Primary Mental Abilities* Chicago. University of Chicago Press, 1938. Psychometric Society, *Psychometric Monographs* No 1.

NOTE Thurstone posits *a group factor* explanation of mental organization The rubrics which he uses to describe the primary mental abilities are *perception, number, verbal, space, memory, induction,* and *reasoning.*

selected in special instances in his day-by-day counseling. Before turning to more detailed consideration of the six selected aptitudes and abilities, attention is directed to another important consideration in dealing with human occupational ability patterns, that of *field-level* concepts.

FIELD AND LEVEL CONCEPTS IN INTERPRETING OCCUPATIONAL ABILITY PATTERNS

One of the great difficulties which the counselor dealing with educational-vocational problems faces is that of counselee choices seriously wrong because they are based upon occupational labels. Some, such as "medicine" or "business," are so broad as to cover many quite different tasks, demanding quite different abilities and personalities. Others are such specific job labels as to be far too narrow and restrictive for long-term goals. Moreover, their meaning is not always uniform from one geographical area to another, and often the label remains constant while its meaning changes because technological developments result in a new, and often quite foreign, constellation of job duties. Williamson[10] refers to the fallacy of occupational labels as follows:

The fallacy of occupational labels may best be explained by means of an illustration. A young man may be attracted to "manufacturing" without having any clear notion of the enormous variety of jobs within that larger field. "Manufacturing" may, and usually does, require the services of chemists, engineers, salesmen, clerks, statisticians, lawyers, personnel workers, advertising workers, bankers, janitors, elevator operators, and so on endlessly. Obviously, "manufacturing" as a vocational choice is too broad and indefinite. In a somewhat similar way, a young man, fascinated by the front-page exploits of "G" men, discovers that they are engaged in activities quite unlike those he has read about It will be seen that this error of choosing a vocation resembles the fallacies which we have designated as

[10] Williamson, E G. *Students and Occupations*. New York: Henry Holt and Company, Inc., 1937. P. 18.

"the glorification of the unusual" and "the attractiveness of the remote."

Darley[11] throws the problem of job label choices into bold relief when he says.

But with these guides in mind, the counselor is in a position to help the student choose the family, *or families*, of occupations in which he has the greatest chances of successful competition. Remember that a student may have the characteristic of more than one family of occupations.

The use of the concept has two strong advantages in vocational counseling. First, it is basically a much sounder and more functional approach to vocational problems than worrying about specific occupational labels selected by the student. Within the family of occupations that seems appropriate, several specific and alternative jobs can be found for the student to consider. In the second place, vocational guidance can begin in the earlier school years, since some of the broad human characteristics of ability, aptitude, or interest can be spotted by tests and other devices even in the junior high-school age range. As a corollary to this advantage, it is possible to relate the claimed occupational choices which the student makes at various stages to families of occupations From the group guidance standpoint, the occupations class might study families of occupations and the counselor might help direct that study to the families which his individual diagnosis indicates are appropriate for each child

Fredenburgh[12] strikes the same key but with a more pessimistic note when he states that

Efforts to set up objective standards through *individual analysis and diagnosis* and to develop further and to use *occupational ability patterns* have struck staggering limitations, not the least of which fall in the lap of school and college administration The former method has shown considerable promise at the upper levels of collegiate education where clinical counseling

[11] Darley, John G , *Testing and Counseling in the High-school Guidance Program* Chicago. Science Research Associates, 1943 Pp. 150–151.

[12] Fredenburgh, F A. "The Gordian knot of vocational guidance," *Journal of Applied Psychology*, 1944, 1 53–66.

services and a fairly extensive "training history" facilitate the disposition of individual cases Such an approach, however, has not proved to be administratively and financially possible at the lower levels of school leaving where ninety per cent of our school population is found. Yet it is at this level where professional services are most urgently needed (Page 57)

The problem of occupational adjustment is, therefore, wisely approached from the standpoint of broad categories of related occupations. The concept of "families" of occupations, of "classes" suggests the approach. These *classes* of occupations should be characterized by a common, identifiable, basic combination of factors which may be associated with, if not directly related to, demonstrated academic ability, measured aptitudes, expressed or inferred interests, hobbies, and leisure time activities, in so far as these may be assessed. (Pages 62–63.) *

When we attempt to deal with job families and occupational ability patterns, we face the field-level interpretation of our data Hahn and Brayfield[13] have described these concepts as follows.

The term "occupational field," as used here, means a broad area of occupations which are related to each other with reference to the abilities, aptitudes, and vocational interest patterns necessary for success. The term "level" may be defined as the general ability or aptitude of an individual to meet complex situations and to master abstract ideas and concepts.

"Field" indicates the *direction* in which an individual should go; "level" indicates *how far* he is likely to progress.

* Mr Fredenburgh's article was written before the advisement program of the United States Veterans Administration in cooperation with educational institutions was in operation The influence of this program has permeated outward from the colleges and universities into the secondary school. In the short time since 1944 enormous strides have been made in making individual analysis and diagnosis available to hundreds of thousands of citizens from all walks and all levels of life. Materials being published from the files of the armed forces guidance centers are advancing our knowledge of occupational ability patterns far beyond our 1944 dreams

[13] Hahn, Milton E , and Brayfield, Arthur H *Occupational Laboratory Manual* Chicago Science Research Associates, 1945. Pp 23–24.

The concept of level came into relatively clear focus with the publication of results from the use of the Army Alpha[14] tests used in World War I. Even though there were large amounts of overlap in the test score ranges for the occupations listed, a definite hierarchy emerged.*

If measured academic ability, or scholastic intelligence, is considered the determiner of level, the counselor must make some arbitrary decisions for purposes of general interpretation. The literature will supply the counselor with a number of such divisions by level. Even though this approach is arbitrary and somewhat artificial because of its basis on a single variable, the concept is useful as a starting point from which to consider an individual counselee. In the article by Fryer and Sparling quoted above, the levels are given as follows:

Intelligence groups (I.Q.)	*General*	*Educational*
M.A. 18 or above I.Q. 120+	Intelligence for creative and directive effort	Ability for honor record in university
M.A. 16.5 to 17.9 I.Q. 110+	Lower grade professional level	Ability for average college record
M.A. 15.0 to 16.4 I.Q. 100+	Clerical and technical occupational level	Ability for high school graduation and some college training
M.A. 13.0 to 14.9 I.Q. 90+	Skilled occupational level	Ability for high school graduation and some college training
M.A. 11.0 to 12.9 I.Q. 80+	Semiskilled and low skilled occupational level	Ability rarely sufficient for high school graduation
M.A. 9.5 to 10.9 I.Q. 70+	Unskilled occupational level	Usually drops out by fifth grade

[14] Bingham, *op. cit.*, pp. 46–47. The reader will find an interesting adaptation of this hierarchy of occupations in terms of level (academic ability) in Fryer and Sparling, *op. cit.*, pp. 56–57.

* It is of interest historically to recall one of the early classifications which used the hierarchy of intelligence as a case for defining level. F. W. Taussig's *Principles of Economics* (already cited), pp. 134–137, presents such an approach.

A second approach along the same line is made by Paterson, Gerken, and Hahn.[15] These writers make arbitrary assignment of the percentage of the population assumed to possess sufficient academic ability to be successful at the various formal educational levels assuming opportunity is present. Their divisions are

Highest 10%	Superior abstract intelligence with training *equivalent* to college graduation from a first-class institution or two or three years of college, or to that of executive of a moderately large business. Ability for creative and directive work is implied
Next 15% . .	High average abstract intelligence with training *equivalent* to high school graduation and/or technical school or junior college.
Middle 50%	Average abstract intelligence with training *equivalent* to vocational high school. Work demanding specialized skill and knowledge, tasks mostly of a concrete nature requiring specialized training
Lowest 25%	Low average or slightly below average abstract intelligence with training *equivalent* to eighth grade or less Work demanding a minimum of technical knowledge or skill but may involve special abilities, such as dexterity in the performance of repetitive and routine work.

It seems probable that these percentages have already shifted and will shift still more under the impact of the GI Bill of Rights, which has enormously extended the opportunities for high school and college education. In fact, in the judgment of one authority who refuses to permit quotation, but who has spent years in the measurement of academic ability, these shifts had already begun before World War II. He asserts further that the assignment of levels of ability by performance in high school and colleges in general have little meaning because of the very large variation in institutions. Thus, while a pupil with an I.Q. of 90 may graduate (perhaps with honors) from one high school, he would fail miserably in another. Thus also it

[15] Paterson, Gerken, and Hahn, *op cit*, pp 21–22.

might take the college age equivalent of an I Q. of 125 + to achieve a master's degree in one university and an I Q. of 100 + in another. His assumption appears to be substantiated by the Carnegie Pennsylvania and other studies. For so-called "first-class" institutions this authority finds the following mean I.Q. equivalents are necessary: high school graduation, 110, liberal arts college freshmen, 120, B.A. or B.S. graduation, 125, M A or M.S., 130, Ph D , 135 +. For educational-vocational counselors, this recognition of the great variability in institutions has much more meaning than has yet been adequately recognized. Only by full knowledge of the requirements in terms of scholastic ability of the institution in which he works, frequently differentiated also by colleges, departments, and individual instructors, can he effectively counsel students. Only by knowing the "standards" of other institutions can he recommend transfer in individual cases where a change to one of "lower standards" might result in successful achievement for his counselee, or, in a different case, a shift to one of "higher standards" might put him on his mettle and be more satisfying.

The divisions of level used by Otis[16] are also well known and widely used.. His groupings are *"very superior, superior, high normal, low normal,* and *dull."* The threshold beginnings of these arbitrary divisions in terms of I Q. are, respectively, 120, 110, 100, and 90. Most authorities tend to use these broad bands of academic ability to yield a rough identification of the approximate level at which an individual can hope to compete on a ladder of jobs running from manual labor to research in nuclear physics.

Because occupational level in many fields is, in general, closely related to level of academic ability, certain specific points will be discussed under that heading in the next chapter The counselor should keep in mind, however, certain fundamentals when dealing with the level concept as related to educational-vocational problems. These are

[16] Otis, Arthur S *Manual for the Otis Self-administering Test of Mental Ability.* Yonkers, New York. World Book Company, 1922.

1. *Level* is always in terms of broad bands, often overlapping, never in terms of a fixed point.

2. *Level* is seldom, if ever, determined from a single criterion such as a test score. Even these broad approximations should be based on all available pertinent data. test scores, academic grades, vocabulary level, physical health, emotional adjustment, and social behavior.

3. *Level* is meaningful only when in a known frame of reference. It is modified by interests, motivation, environmental and other considerations.

4. *Level* must be considered as an index of both aptitude and ability—the short- and long-time future projected from the past and present.

Field

Field can be further described as the educational-vocational area in which an individual may have a comparative advantage in vocational competition In instances where an individual has an advantage over a considerable number of others in one or more abilities (*i e.*, is significantly above average compared to a known occupational group), counselors help to make one type of decision. In instances where the individual is below average in all abilities, when compared to an occupational group with which he must compete, another type of decision is indicated. Figure 3 illustrates this problem.

It is important to note that fields are usually named to coincide with aptitudes and abilities. We tend to speak in counseling of a scientific field, a mechanical field, or the field of art. Often we combine ability areas to form fields. Examples of this are the scientific-mechanical field at the professional or semiprofessional level or the scientific-mechanical-social field at the technical level. The first pattern includes a number of occupational labels such as "physicist" and certain types of engineers.

ABILITY AREAS

Academic Social Mechanical Clerical Musical Artistic Phys Coord.
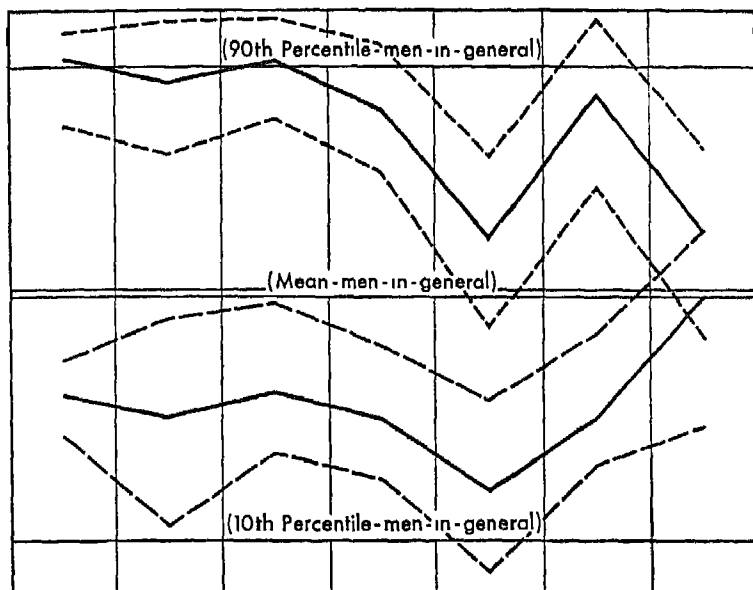
FIG. 8 Two ability patterns illustrating the field-level concept The two patterns are of similar shape, excepting the area of physical coordination The upper pattern illustrates an individual with advantages over most men-in-general in the majority of ability areas The lower pattern is that of an individual at a disadvantage competing with men-in-general.

Pattern I can be described as suitable for occupations in a scientific-mechanical-clerical-artistic field, at the professional or higher technical level

Pattern II can be described as suitable for occupations in a mechanical field at the skilled to semiskilled level

Note that the patterns are drawn as areas of varying width for each ability This type of presentation illustrates the errors of estimation and measurement. The narrower the band for an ability, the more certain we are of the tools and techniques from which our estimate was derived The broader the band, the less certain we are of the approximation

The reader is referred to pages 164*ff*, in Chap 5, where occupational information is discussed as a tool of the counselor. The references on page 186 of this chapter will also be helpful. Interesting materials will be found in the man-

ual of the Kuder Preference Record[17] and in the Minnesota Occupational Rating Scales.[18] Crude and undefinitive as this approach may seem, it is thus far our most effective one when we attempt to aid individuals in their long-range planning. In an industrial situation it is possible to use selective techniques to consider the appropriateness of jobs A-B-C for applicant I-II-III In general counseling, with long-range plans involved, our predictions are safest when we make best use of the *field-level* concepts.

[17] Kuder, Frederick. *Manual for the Kuder Preference Record.* Chicago Science Research Associates, 1946

[18] Paterson, Gerken, and Hahn, *op. cit*

Chapter 7. APTITUDES AND ABILITIES (*Continued*)

A basic principle of dealing with human problems in a clinical situation is always to consider as fully as possible the whole individual. Nevertheless, we are handicapped by two facts (1) that it is quite impossible for any counselor to know all about any living, dynamic human organism, and (2) that it is very difficult to comprehend and express more than one aspect of the counselee at a time through the use of words. In recognition of these handicaps, the materials in this chapter attempt to treat with the whole individual but as if he is reacting in general ways which can be conveniently labeled to facilitate explanation of the way in which the counselor studies him At the same time, it must be clearly understood that these labels do not carry any implication that the authors believe a person can be viewed and comprehended by isolated segments of personality Such labelings of patterns are merely pegs upon which some of the clothing of the systematic case study can be hung

A third difficulty in presenting this theory of ability patterns is that much of the material still is in part speculative and controversial and not founded on rigorous scientific research. We cannot demonstrate, analyze, and describe single, relatively unique abilities such as those possessed by a professional highly paid coffee taster, or even commonly identifiable patterns of behavior which deserve a seemingly clear-cut name such as "social intelligence" or "creative ability." This situation is not peculiar to counseling alone All clinical workers find themselves constantly faced by this problem. The social worker must use descriptive labels and

take action which has only clinical (nonexperimental) bases The physician, despite the long strides which have been made by medical researchers, spends much of his time practicing on the basis of clinical experience. In psychiatry and psychoanalysis especially there is an increasing struggle to clarify the concepts of syndromes and the patterns of abnormal behavior by experimental methods. In counseling, therefore, as in these other older fields, we employ demonstrable research findings where we can and elsewhere use the most logical and clinically effective and understandable terminology available in our exchange of data and ideas.

In doing so, the authors are aware, as the reader must be, of the ever-present danger of complete acceptance of the named abilities, discussed in this chapter, as discrete or unique The soundest way to consider this point is to regard all of the aptitudes and abilities to which we attach counseling labels as logically and psychologically derived specialized aspects of dynamic personality organization Our experimental pioneers—Terman, Thurstone, Kelly, Paterson, Allport, Spearman, Pearson, and Thomson, to name only a few—have blazed trails which appear generally reasonable and which help us in our clinical counseling Certain aspects of these named traits, when subjected to statistical treatment, appear to be "relatively unique" They also frequently seem to be related with each other to some extent in terms of the intercorrelations discovered among and between them when tests purporting to measure aspects of them are used and the results are treated statistically.

The authors are aware that most of the statements about aptitudes and abilities which follow are subject to many modifications and qualifications. To state all of these qualifications, however, would lengthen the chapter far beyond practical limitations and lead only to confusion There is a strong temptation, too, to write the history of the development of each of the concepts presented Such a presentation is needed and would be well worth while, but it is properly the material for another book with a different purpose.

Documentation of certain statements will supply the interested reader with starting points for investigating the historical backgrounds of explanations of relatively unique aptitudes and abilities. With these comments and warnings, we now turn to consideration of selected human aptitudes and abilities and treat them with only a minimum of essential specific qualifications.

The aptitudes and abilities with which we are concerned here are *academic, mechanical, social, clerical, musical,* and *artistic.* For each category a definitional description is made, the levels of the ability are presented, and the methods of making judgments and expressing them are considered. Some occupational examples are provided for purposes of clarification

Aptitudes and Academic Ability

Academic ability, as we use the term here, is not a synonym for intelligence as if the only *intelligence* was the power to get along in school and with books in a world of words. Instead, *intelligence,* as defined in Warren's *Psychological Dictionary,* is a broad concept concerned with the total organism's adaptive responses to novel situations or problems. *Academic ability* refers to the effectiveness and suitability of response to situations usually arising in a formal educational environment or equivalent learning situations in nonacademic life. This is a usable distinction to which the authors resort for the sake of logic, clarity, and convenience Bingham[1] makes this differentiation nicely in regard to soldiering:

> Instead, the question is How intelligent is he now? What can he learn and how fast can he learn it?
>
> Neither is it a matter of practical concern to know what a soldier's *native* intelligence was at birth, before his mental

[1] Bingham, Walter V "Inequalities in adult capacity—from military data," *Science,* 1946, 104 147.

development had been facilitated in any degree by stimulating surroundings or hampered by a stultifying environment. The assignment officer wants an index of what the new soldier can be expected to learn, rather than a figure which purports to tell what he might have been able to learn if only he had had a better home, no enfeebling illness and a great deal more education

Because counselors find much of their effective work with age groups quite comparable to certain of those faced by the assignment officer, the parallel is apt. Students in senior high schools and colleges are beyond the age when the measured I Q. is particularly meaningful. The counselor's problem is the prediction of the learning level at which the counselee is likely to reach his ceiling, either in academic situations or in their nonacademic equivalent. With children under fifteen or sixteen years of age, the I Q can be used properly only as a general ratio encompassing the total rate of mental development in an omnibus manner. The high school and college counselors' question must be: How well will John learn specified types of materials such as mathematics, English, psychology, and history in the formal educational environment in this institution and in that occupational setting, in comparison with a given group norm or point of reference such as this present student body or that particular group of employees?

The materials with which the subject is asked to work, when measurement of academic ability is attempted, give us a clue to definition. Bingham, in the reference cited above, takes his data from a test based upon verbal, arithmetical, and spatial tasks Thurstone and Thurstone[2] use a number series, arithmetic, and figure analogies for the quantitative part of their test, and completion, same-opposite, and verbal analogies to yield a score for the linguistic section of the instrument. Toops' Ohio State University

[2] Thurstone, L. L., and Thurstone, Thelma Gwinn. *American Council on Education Psychological Examination* (college ed.). Washington, D C.. American Council on Education, 1924–1944

Psychological Test, Form 22,[3] includes three subtests—same-opposites, analogies, and paragraph comprehension. The basis for predicting success in formal education, therefore, with some exceptions, tends to be largely verbal The Pressey Senior Classification and Senior Verifying Tests[4] have been widely used with students in secondary schools and with unselected adults, particularly in business and industrial situations These tests include subtests concerning opposites, recognition vocabulary, concept recognition, practical arithmetic, number and letter series completion, practical judgment, and information.

Levels of Academic Ability

The matter of level has been partially discussed in the preceding chapter. At this point we introduce an important aspect of the concept of level without reproducing all of the materials already presented. The use of the Army General Classification Test with 10,000,000 men has given us the best cross section we have ever had of the academic or learning ability of the adult American male. Comparable data from this test when administered to women are not yet available However, personal experience with the results of this test used with approximately 18,000 women in the United States Marine Corps indicates that the raw score distributions for women are very similar to those for men

In Bingham's reference above, five levels of academic ability are presented.

Army Grade I, scores above 120
Army Grade II, scores from 110 through 119
Army Grade III, scores from 90 through 109
Army Grade IV, scores from 70 through 89
Army Grade V, scores below 70
($\sigma = 20$, $M = 100$)

[3] Toops, Herbert A *Ohio State University Psychological Test,* Form 22 Columbus, Ohio The Ohio State University Press, 1937

[4] Pressey, S L , and Pressey, L C. *Senior Classification and Senior Verifying Tests.* Bloomington, Ill . Public School Publishing Company, 1922.

In terms of academic ability, Bingham believes that those in Grade I are good risks for college training. Because 184,000 (6 per cent) of the 2,764,000 men in the Army Grade II group had completed college, it is obvious that an appreciable number of men in this grade are of college caliber. This is especially clear when the wide variations in college "standards" are considered.[5] In general, men in this group made sound officer material. The men in Grade III "furnished a substantial number of corporals, sergeants, clerks, and technicians and a great many capable privates." Although there is overlapping, Grades IV and V showed a steadily decreasing amount of ability to learn the mathematics, English, etc., essential to the various levels of soldiering. The findings thus give a clearer, but similar, picture than that of the Army Alpha Test results in World War I.

For practical purposes of dealing with academic ability as a measure of peacetime occupational level, the counselor will find the following table useful although not experimentally verified. It is, of course, subject to numerous qualifications in its interpretation.

TABLE 2 LEVELS OF ACADEMIC ABILITY AND EDUCATIONAL-VOCATIONAL OUTLETS

*Level of academic ability**	*Army General Classification test equivalent (estimated)*†	*Educational and vocational outlets*‡
Professional, semiprofessional, and executive occupations (highest 20% of men-in-general)	Grades I, II. Standard scores of 115 and above	College graduation or its equivalent. Creative and directive work Examples Engineer, physician, lawyer, business executive (large firm), college and high school teachers, dentists, landscape architects, etc

[5] Strang, Ruth. *Educational Guidance. Its Principles and Practice.* New York. The Macmillan Company, 1947. Appendix D, pp 243–254.

TABLE 2. LEVELS OF ACADEMIC ABILITY AND EDUCATIONAL-VOCATIONAL OUTLETS. (*Continued*)

*Level of academic ability**	*Army General Classification test equivalent (estimated)†*	*Educational and vocational outlets‡*
Technical, clerical, supervisory occupations (from the 50th-80th percentile of men-in-general)	Grades II, III Standard scores from 100 through 114	Junior college, technical school, and high school graduation or its equivalent Examples Aviator, laboratory technician (lower level), chiropractor, detective, minor business executive, insurance salesman, pattern maker, retail dealer, etc.
Skilled tradesmen and low-grade clerical workers (16th–50th percentile)	Grades III, IV Standard scores from 80 through 99	High school, junior high, or some grade school education Work demanding specialized skill and knowledge Work often done under supervision.
Semiskilled and unskilled occupations (lowest 16%)	Grades IV, V Standard scores below 80	Education seldom above the elementary grades Examples Boiler washer (R R.), day laborer, farm laborer, junkman, sailor (deck hand), street sweeper

* From *Minnesota Occupational Rating Scales*, by Paterson, Gerken, and Hahn

† Bingham, Walter V "Inequalities in adult capacity—from military data," *Science*, 1946, 104 150

‡ Adapted from the *Minnesota Occupational Rating Scales*

Table 2 is typical of the generalized approaches to levels of academic ability. The divisions are useful in making

rather rough determinations but frequently do not fit individual cases. In addition, application of this formula alone will break down because of the exclusion of the many factors, such as motivation, interest, emotional maturity, etc., which affect performance within the range of academic ability as measured by tests or school grades. Herein lies one of the counseling dangers of overinterpreting our data and predicting too much from a single criterion.

The counselor will quickly discover that other, and much more specific, points of reference are needed when he plans with the counselee his educational-vocational future. It is necessary to repeat that it has been said that "there is a four-year college granting a baccalaureate degree for every level of normal intelligence." If we include all of our colleges with "low standards" this is probably very close to an accurate statement Super[6] summarizes this point as follows·

> It should be pointed out also that great differences exist between schools and colleges. There is a college for every level of mental ability. Of three hundred and fifty-five colleges which reported the results of an intelligence test given to all of their freshmen in 1938, the highest-ranking had a freshman class with an average I Q. of 122, the college at the middle of the distribution had a class average of 108, and the lowest-ranking college had a freshman class with an average I.Q of 94 One-fourth of the freshmen in the last college had intelligence quotients of less than 90, less than one-fourth had I Q 's of 100 or more, were, that is, of "average" or better than average intelligence!

Not only are there differences between and among colleges and universities, there are equally great differences between and among the schools and departments on the same campus and sometimes between instructors in the same course. In terms of academic ability required for graduation the schools and colleges on a university campus may range over a wide scale In general, science curriculums,

[6] Super, Donald E. *The Dynamics of Vocational Adjustment* New York: Harper & Brothers, 1942. P. 51.

including medicine, physics, chemistry, psychology, and mathematics, are found to require higher measured verbal and numerical abilities than do certain general types of curriculums or those preparing people for different or "lower" professional, technical, and semiprofessional occupations. On one campus which stands high among our great universities, the four-year college at the bottom of the scale of academic ability requirements had an average I.Q. equivalent for freshmen below that for the high school seniors in the state It is not the business of the counselor to inquire as to whether such a situation is sound or silly, in terms of individual, social, or educational philosophy. It *is* his business to know the situation as it exists in order that he may soundly counsel with students in quandaries.

Eckert and Marshall[7] in the New York State Regents' Inquiry supply evidence of curricular differentials at the high school level, showing the decreasing amounts of measured academic ability needed as we move from the requirements for college entrance, through those for the general and business, to the vocational curriculums. Moreover, within each of these curricula they found teacher differences. As those counselors who have worked in large secondary or collegiate institutions know, the difference between high and mediocre grades often lies in selection of the teacher rather than in the field or course.

In helping counselees to determine the appropriate level of endeavor for occupational preparation and for further formal academic training the counselor must find answers to the following types of questions.

1. What type of learning is involved?
   a. Concrete material learned by example and observation?
   b. Abstract materials involving symbols to represent objects and ideas?

[7] Eckert, Ruth E., and Marshall, Thomas O *When Youth Leave School.* New York McGraw-Hill Book Company, Inc , 1938 P. 93

c. Quality of learning?
   d. Quantity of learning?
   e. Speed of learning?
   f. Length of learning period?
   g. Demand for retention of various types of materials learned?
   h. Skills required, general and specific?
2. What is the level of competition?
   a. For the threshold jobs?
   b. For advancement in the field?
   c. For ceiling achievement?
3. How much formal education is necessary?
4. How much formal education, at what level, and of what kinds can this individual absorb?
5. How many and what kind of activities related and contributory to formal education are essential?

Making and Expressing Judgments of Academic Ability

Making judgments of academic ability (and aptitude) involves a process of considering a number of criteria No single index of academic ability, with sufficient reliability and validity, exists Bingham[8] cites three helpful basal criteria. "Just how intelligent (a person is) is measured in terms of (*a*) the level of difficulty of the problems he can solve, (*b*) the range or number of problems he can solve at that level, and (*c*) the speed with which he can solve them." To these, we would add a fourth: (*d*) the precision and accuracy with which he can solve them

The difficulty level of the problems one can solve is at present only crudely measured in terms of standardized tests which differ one from another in many ways. There is no standard yardstick of problem difficulty, particularly after the individual passes into his teens. The Stanford-Binet intelligence test does give us a fairly effective general yardstick during the years when mental age is still below its

[8] Bingham, Walter Van Dyke. *Aptitudes and Aptitude Testing* New York: Harper & Brothers, 1937. P. 36.

apex. Just as we have no single standard of problem difficulty, we likewise have no satisfactory measure of how many such problems the individual can solve at an estimated standard, *i.e.*, the horizontal range as related to the vertical range of his problem solving. Acceptance of any one of the many standardized test batteries limits us to one inadequate point of reference, and our findings must be stated and interpreted in terms of this point of reference. Again, speed, accuracy, and precision in problem solution all force us into similar quandaries, for speed may destroy accuracy or precision may inhibit speed. In the face of these complex variables and the crudity of our instruments, we nevertheless reach roughly practicable results through the use of problem sampling techniques, but we have by no means approached, as yet, adequate measurement of ability to solve problems which would be required to meet Bingham's criteria fully.

In counseling practice, therefore, we make use of the best samplings we can find, in regard to indices derived both from measurement and from norm populations deemed to be fairly representative of the limited world in which the counselee is assumed to move Such sampling judgments of amount and quality of academic ability are usually made in terms of the following types of evidence.

Subject-matter grades
Results of tests, such as
  academic "intelligence" tests
  reading tests
  academic achievement tests
Performance in the environment—ratings of observed behavior
Self-estimates
Perseverance in academic and related tasks

Since this section deals with specific aspects of making judgments about academic ability and the concept of levels has been discussed above, there remains for our purpose only a strong warning about the manner in which a counselor conveys his findings and judgments to the counselee. Most

counselors do not favor the giving of scores, percentiles, I.Q.'s, or other results of tests to the counselee. Darley[9] states the viewpoint of the authors well when he says:

> Do not give isolated test scores to the student. It is quite likely that even the counselor at first understands only vaguely the meaning and interpretation of test scores, even though he may have been exposed to the elements of statistical methods and test procedures. How much less likely it is, therefore, that the student, lacking as he does the counselor's experience, will understand and interpret the test information wisely. If he wants to know his test results, tell him his approximate rank, saying he is in the upper one-third or upper one-fourth or lower one-fifth. But even in making a statement of this kind, be sure to describe also the group with which he was compared.
>
> For example, tell him that he is in the upper half of this group of high-school seniors on a measure of ability but that this rank would place him in the lower half of students entering a near-by university. Be very careful not to give out I Q 's (which are generally misunderstood by the public), or specific grades or percentiles on aptitude or interest tests And by all means *do not give out scores on personality tests* This mistake is very serious and frequently results in parental interference and indignation. Any rapport which has been established may easily be lost.

The safest method of presenting estimates of occupational level and academic ability is probably the use of adjectives to describe relatively broad qualitative and quantitative bands. Such expressions as "in the top tenth of graduates from junior high school in your city" or "in the upper half of college freshmen in this university" have meaning "Very superior to—," "superior to—," "average compared to—," "somewhat below average for—" are useful methods of presentation. It is well to remember that, in working with secondary school students (perhaps with all cases), "some-

[9] Darley, John G. *Testing and Counseling in the High-school Guidance Program.* Chicago. Science Research Associates, 1943. Pp 178–179.

what below average," "a little slow," or "this is not your strongest ability" are as low descriptively as one should ordinarily go. Comparisons often should be made both with norm groups and in regard to intrapersonal strengths. "This is one of your stronger abilities, but compared to professional draftsmen, you are somewhat below the average" One of the grossest of all errors, and one too frequently made by untrained advisers, is the comparing of noncomparable abilities. There is, for example, a widespread tendency on the part of academic personnel to look upon mechanical, artistic, or social abilities as being inferior to academic, scholastic, and verbal abilities when, in fact, they cannot be compared any more than can sunsets and carburetors.

Use of the I Q. is a special case. Even psychologists do not always adhere to a rigorous definition or use of this concept Teachers, however, have been so strongly indoctrinated to believe that it is *the* measure of academic ability, no matter how arrived at, and that it is a fixed brand which a pupil must wear for life that they appear, in some instances, to be lost if the measurement of academic ability is not stated in this form or if any qualities and modifiers are attached to it. Hence, we are still often forced, as counselors, to oversimplify our discussions of academic ability with teaching personnel, despite such warnings as Garrett's[10] that

> The requirements for a constant I.Q. are *not* met by any group tests with which I am familiar They are met by the Stanford-Binet The term I Q , therefore, should *never* be used with group tests but should be confined strictly to tests of the Binet type. To be sure, some group tests keep the I Q approximately constant by assigning an I Q of 116, say, to the score in each age distribution one sigma above the mean; an I Q of 132 to the score two SD above the mean, etc But such statistical I Q.'s are *not equivalent* to Stanford-Binet I.Q.'s and when used interchangeably confuse rather than inform

[10] Garrett, Henry E "The effects of schooling upon I.Q.; a note on Lorge's article," *Psychological Bulletin*, 1946, 1 76.

Large secondary school and college personnel programs usually administer group paper-and-pencil tests of academic ability and too often use the results as if they were absolute equivalents with individual tests.

Counselors also face difficulties in reporting the results of estimates and judgments of academic ability in quantitative terms other than I.Q.'s. Teachers in secondary schools and professors in colleges have found that it is easier to understand and use percentile ratings than to comprehend and employ standard deviations. Many of them have little understanding of the distortions which can, and do, occur when percentiles are used. Nevertheless, we continue to use this crude form of measurement because, while faculty and counselees seldom have insight into measures of variability, they do comprehend that a given student is "better than 70 out of 100" in ability to pass social science courses in this university, or poorer in applying chemical formulas than "half of the laboratory technicians with college degrees." However the counselor may rebel against vague or inaccurate interpretations, and however deep his own understandings of mental organization and its proper explanation may be, he will, for a long time, be forced to forego psychological purity in the interests of being understood by both colleagues and counselees.

Mechanical Aptitude and Ability

Although factors of mental and physical organization which contribute to what is called *mechanical ability* have been given attention for four decades, research has been chiefly fragmentary and concepts of its application to educational and vocational counseling quite limited. Early studies dealt primarily with manipulative skills and the coordinations involved in jobs in the carpentry and machine shops and on assembly lines at the semiskilled and skilled levels of industrial employment. To these, in time, were inevitably and logically added experiments to demonstrate

that a second factor, insight into the setting and relationships of objects in space, is also basic in mechanical ability. A third factor, motion, was observed as important and, since motion involves time, timing, rhythm, etc , these too were introduced, and time-motion-space-coordination-multiple-attention researches of some complexity were undertaken

Because, as indicated, research in this field was initially restricted to the lower level occupations, the label *mechanical ability* acquired the stigma of being somehow of lesser value to man and to society than other abilities, especially the academic. Teachers and guidance personnel in the schools and colleges widely and falsely assumed that any student who was "too dumb" to perform at high level in history, English, and mathematics would, by that very token, be successful in printing, metal, engine, or woodworking shops. This notion has long been disproved on many fronts but it still persists in the minds of many, and in a large number of public schools the practice of assigning "low-level" academics to "vocational" departments is continued Researchers, on the contrary, making the obvious observation that certain high-level professional people such as engineers, architects, and physicists must also deal with matters involving neuromuscular coordinations, manipulative skills, space relationships, motion, time, and timing, extended their investigations of the place of mechanical ability in the higher professional and technical occupations and began to work with the combinations of this ability with academic conceptual, verbal, and numerical factors.

What has not yet been clearly or widely seen and studied is the fact that what we call mechanical ability is an essential element in the performance of many other tasks than those commonly thought of as "mechanical," and at various levels. A dentist or surgeon, for example, must possess in the highest possible degree a sense of space relationships, must be able to locate with exactness the placement not only of gross and fine muscle layers, bone structures and organs, but also of blood vessels and filamentlike nerves. His coordinations

must in certain respects be swift and perfectly controlled lest the knife or the needle slip. In a quite different fashion, and toward other ends, the painter, the sculptor, the violinist, the airplane pilot, the modiste and dress designer, the master of theater craft, and many others must possess mechanical ability of high order in combination with other types of abilities, if they are to perform at all successfully. Opportunities for research in this field are endless and the paucity of our present knowledge should stimulate counselors to be both cautious and imaginative in interpreting findings on mechanical ability tests to their counselees in considering their educational and vocational problems. With this brief background, we turn now to consider some of the research that gives the counselor some aid in attacking the problems of his counselees.

With the exception of the Minnesota investigation,[11] this research, as suggested, has tended to be typically fragmentary Our present knowledge of the factors which permit some individuals to be successful, and reasonably happy, in manipulating inorganic and organic objects in space is limited. Our definitional problem is appreciably more difficult when we must consider individuals particularly well fitted for dealing with the symbols which represent objects in space Such workers include engineers, physicists, architects, surgeons, etc.

Although the differentiation hypothesis[12] of mental organization helps us to understand some of the phenomena in measuring and judging quality and quantities of mechanical ability in adults, it does not explain the specificity which we find when we attempt to judge, measure, or estimate this ability. At the professional and higher technical levels of mechanical ability there is an obvious strong relationship

[11] Paterson, Donald G, Elliott, Richard M., *et al* *Minnesota Mechanical Ability Tests* Minneapolis University of Minnesota Press, 1930.

[12] Garrett, Henry E. "A developmental theory of intelligence," *The American Psychologist*, 1946, 9:372–378.

between successful behavior in solving problems of a mechanical nature and verbal and numerical factors of mental organization. And at similarly high levels in art and music, mechanical ability must be combined with appreciative, interpretive, and creative aesthetic "intelligence" or ability According to Garrett's hypothesis, noted above, specific factors should emerge as the process of individuation proceeds. Even with younger subjects, the Minnesota investigation demonstrated specificity of test results to particular mechanical operation Some light is thrown on this problem by the assumptions underlying the Minnesota investigation.[13]

The assumptions involved in this study should be stated explicitly because they determine the significance of the term "mechanical ability" as used in this research. The theory of unique traits, adopted as a working hypothesis, required the devising of tests and teams of tests which would give a measure of mechanical ability as unrelated as possible to a trait for which adequate measures were already in existence, namely, intelligence required for academic success The fact that such tests could be devised does not imply that there is no relation between mechanical ability and intelligence as those terms are ordinarily used, or that intelligence is not involved in success in mechanical work. If intelligence contributes to shop success, then such a mechanical test plus intelligence will predict shop success better than another mechanical test of equal validity but correlating higher with intelligence.

Another assumption was involved in the choice of a criterion by empirical rather than absolute standards. The validity of success in shop courses as a criterion was not determined by checking it against a supercriterion, for it is evident that its validity could never be finally determined in objective terms. Some still higher criterion would always be needed. The justification for the criterion employed in this study, therefore, is whatever soundness there is in the common-sense judgment that mechanical ability is required for proficiency in the kinds of work included in shop courses of the kind selected for this experiment

[13] Paterson, Elliott, *et al*, *op cit*, p. 298

The major conclusions reached in the Minnesota studies are important. Two individually administered tests were developed involving relatively unique spatial relationships, eye-hand dexterity and, in one instance, insight into eye-hand-tool mechanical operations. One paper-and-pencil group test showed promise despite a fairly high correlation of its results with the results of general intelligence tests.* No single general factor of major importance was found. "Low intercorrelations between different measures of mechanical ability suggest that factors of high specificity play a major role *ibid.,*" Environmental factors are reported as having played a minor part in the test scores Sex differences could not be clearly established in tasks where greater general strength, characteristic of the male in the age group, was not involved. Perhaps the most startling finding was that students majoring successfully in vocational secondary schools and those in a college of engineering were not demonstrably superior on a test score criterion to individuals in academic curriculums.

Super[14] treats manual skills, visualization of spatial relations, and mechanical ability separately, rather than as contributing aspects of performance, or as supplementary factors, which yield behavior classifiable under a single head. He avoids the formulation of a definition, understandable in any concept as complex and tentative as this. Instead he emphasizes the adjustment of the worker and job satisfaction as germane to the counselor's efforts to aid individuals toward fitting their ability patterns to job patterns, no matter how general or specific these may be.

Viteles[15] reviewed research on mechanical ability prior to 1932. His review covers the effect of measures of mechani-

* As yet unpublished materials indicate this relationship between the Army General Classification Test and the Army Mechanical Aptitude Tests used by the armed forces in World War II

[14] Super, *op. cit*, pp. 71–76.

[15] Viteles, Morris S. *Industrial Psychology* New York: W. W. Norton & Company, 1932. Pp. 230–238.

cal ability on job-selection programs if we entertain any one of various hypotheses regarding the nature of mechanical ability. These hypotheses are (1) mechanical ability is composed of highly specific aspects or factors, (2) mechanical ability is a general ability but relatively unique and unrelated to other abilities; (3) mechanical ability is identified only as behavior resulting from a restricted number of group factors, (4) mechanical ability is an unmodified gestalt phenomenon, dynamic, complex, and in such flux as to be impossible to pin down. Viteles also avoids a definition.

Another approach is that of the ratings in the Minnesota Occupational Rating Scales.[16] These are based upon the judgments of specialists in the field of vocational and industrial psychology. Although these ratings, like all similar estimates, are crude, nevertheless they are useful in counseling when they are combined with the concepts of field and level as derived from analysis of occupational processes matched with educational-vocational problems. No hypotheses regarding the basic factors of mechanical ability are provided in this source It does, however, attempt a definition formulated as follows: " . . . both the ability to manipulate concrete objects—to work with tools and machinery and the materials of the physical world—and the ability to deal mentally with mechanical movements."

Although this definition is helpful to the counselor it poses difficulties. The major snag lies in its implication that the abilities necessary for the master mechanic, the electrical engineer, the surgeon, the airplane pilot, the violinist, and the sculptor are of the same order and at the same level. Each of these occupations is rated as being in the top 10 per cent of jobs requiring mechanical ability as a prime factor, but the skills and insights used in performing the duties of these occupations are by no means demonstrably identical nor even necessarily closely related. The master

[16] Paterson, Donald G, Gerken, Clayton d'A, and Hahn, Milton E. *Minnesota Occupational Rating Scales.* Chicago. Science Research Associates, 1941. P. 21.

mechanic has learned his trade by some years as an apprentice, service as a journeyman, and extended experience beyond this stage. His understanding and visualization of mechanical movements more often are derived from practical than from normal school or college experience. Ordinarily his high level of performance is related to eye-hand, eye-hand-tool, and gross muscle coordinations. A high order of comprehension of concrete spatial relationships and of time and motion is present also. He may or may not know or use the academically learned and mathematically expressed laws of mechanics which are seen by the university-trained engineer to govern the outcomes of his job behavior.

The electrical engineer often is, but need not be, a person gifted with a high order of mechanical dexterity. His major competence is usually in terms of numerical, spatial, and verbal factors at a symbolic level. The surgeon, airplane pilot, violinist, and sculptor also must each possess high dexterity combined with quite different abilities in each case. All of these combinations constitute a denial that high technical skills are less worthy than academic abilities or that the young possessor of such aptitudes is necessarily headed for subprofessional work.

In summarizing, then, the problem of defining "mechanical ability," our major concept is the probability that we are not dealing with a single, relatively unique trait but rather with a broad and variable pattern of behavior. We use the term "mechanical ability," therefore, as a convenient one to express patterns of job behavior, based upon various factors of mental organization, some of which have been explored by research, others assumed as tentative, constructed on the basis of observation and logical speculation. A study such as one by the staff of the Division of Occupational Analysis, War Manpower Commission, in *Educational and Psychological Measurement*[17] is representative of current applica-

[17] Staff, Division of Occupational Analysis, War Manpower Commission. "Factor analysis of occupational aptitude tests," *Educational and Psychological Measurement*, 1945, 2:147–155.

tion of the techniques of factor analysis to the problem of identifying factors which result in certain types of human behavior valuable in particular tasks or job-family situations Mechanical ability can best be conceived, for counseling purposes, as a dynamic, qualitative, and quantitative pattern of factors including symbolic, concrete, and manipulative aspects of spatial, numerical, verbal, motion, and time factors as well as a controversial general factor. The presence of these specific factors in many different combinations among themselves and with others, at whatever level, will determine the counselor's general approach regarding mechanical ability to any counselee and his educational-vocational problems. The counselee will almost never understand all that lies back of the counselor's discussion and recommendations, but the counselor should have a clear understanding of how he himself reached his conclusions

Levels of Mechanical Abilities

The level at which a counselee may come to apply any of the special abilities appears to be determined in part by the level of his academic ability. This is illustrated in Table 3, where mechanical ability is held constant while academic ability is free to vary. As the level of academic ability is depressed, the occupations for which the individual may be considered suited fall lower in the prestige hierarchy. One may have skills for manipulating objects in space which place him in the upper one-tenth of the general population but, unless his ability to deal with complex new situations is commensurate, the level of the populations with which he can compete in the mechanical area is limited.

The Minnesota Occupational Rating Scales illustrate this relationship clearly. In this source the highest level of mechanical ability is labeled "Professional and Higher Technological." As has been indicated above, the professional level includes only those with power to use symbols to represent objects and their relationships in space, time, and motion

The various types of engineers are given as examples. Included with the professional in this highest level are those who are judged to possess a lesser amount of academic

TABLE 3 LEVELS OF MECHANICAL ABILITY AND AMOUNTS OF ACADEMIC ABILITY NECESSARY FOR COMPETITION AT VARIOUS OCCUPATIONAL LEVELS

Academic ability	*Mechanical ability*	
Professional level (top 10%)—College ability	Professional level· Use of symbols representing concrete objects Superb ability to manipulate concrete objects	
	-90th percentile-	
Technical level (76th–90th percentile)—Junior college and technical school ability	Technical level Draftsman, foreman, and supervisor in mechanical occupations	
	-76th percentile-	
Average level (middle 50%)—high school ability	Skilled to semiskilled level:	Mechanic (average) Repairman Electrician Carpenter Potter Railroad Fireman Truck driver
	-26th percentile-	
Below average level (lowest 25%—Grade school or less ability	Semiskilled and unskilled level	Wrapper Bench assembly Day laborer

ability, but who deal competently and practically with three-dimensional objects in space, as, for example, the toolmaker and master mechanic.

We use the term *technical level* (as distinguished from

technological) in Table 3 to indicate those workers who work with both symbols and actual objects, but who frequently do not possess sufficient academic ability to compete in the formal type of training to which the engineer is subjected These workers have deep insight into mechanical relationships and movements. They can use both their working "know-how" and their knowledge of engineering principles acquired through on-the-job training and long experience Many of these people have had some formal education in technical schools at the junior college level.

The skilled workers in the mechanical field, as conceived on this rating scale, are those who work under the supervision of professional and technical workers, although enjoying a large amount of freedom within the limits of their specialties. Average academic ability is needed to reach the competence demanded by the work which the skilled tradesman performs Because the term "average" is used here to mean those who fall between the 26th and the 76th percentiles on a standard test of scholastic competence, there are as wide differences in academic ability as in manipulative skills between the best and poorest skilled tradesmen. As our table shows, the levels of academic ability and a special set of mechanical abilities usually coincide, but in some types of jobs it is not necessary that they do so.

The lowest levels of mechanical ability need not be considered at length here. Large numbers of marginal workers earn their livelihoods at these lower levels. The counselor finds it difficult to work with individuals in the lower end of the distribution because occupational potentialities are more restricted. Although the *Dictionary of Occupational Titles* lists large numbers of specific job labels calling for low-level mechanical skills, the job differentiations are not sharp. The individual who can perform the duties of one can perform as well those of an amazing number of the others at the same level. Examples of this are easily seen when we list a number of such job titles. boiler washer, scrubwoman, day laborer, junkman, garbage collector, chambermaid, long-

shoreman, deck hand, street sweeper, and textile worker (routine).

Estimating, Judging, and Measuring Mechanical Ability

The counselor must make his estimates, judgments, and measurements of mechanical ability always in terms of individual cases and at the levels at which each appears to have possible opportunities for occupational success and adjustment. Sources of information helpful to the counselor include hobbies, stated and measured interests, performance in school situations involving mechanical ability at an appropriate level, work experiences, and the results of a number of tests which tap various specific aspects and levels of mechanical ability and aptitude.

The longitudinal record of leisure-time activities as revealed by the autobiography, case record, or interview sometimes yields pertinent information. The counselee who has maintained a basement workshop over a relatively long period of time, who has completed increasingly complex projects of good quality, and who evidences enthusiasm in his plans for further future adventures in the field has indicated ability and interest which in turn may indicate aptitude for further training and growth toward full-time employment Such a record indicates interests which, especially if confirmed by other evidence, may point in the direction of a mechanical field and give some prediction of achievable level. Shop grades and achievement in arithmetic and mathematics may be significant. Success in physics and chemistry have a bearing, particularly if the counselee has demonstrated competence and interest in the laboratory. If the counselee has had opportunities to make relatively free choices of various types of occupational experiences and has chosen and performed successfully in mechanical areas, this, too, may be valuable as an indicator of interest and ability Even when choice was not free, as in assignment in the armed services, the evidence of performance and degree of satisfaction may be significant. Standardized tests

which measure such factors as groups of numbers and spatial concepts as well as manipulative dexterities may also yield clues for both the counselee and the counselor It should be reiterated here that we do not possess any good general test of mechanical ability in the same sense that the Stanford-Binet tests academic ability in children and adolescents We are forced instead to utilize tests measuring a variety of quite specific skills and differential aptitudes and from these arrive at our generalized judgment in terms of the clinical synthesis and analysis of these test results and all other pertinent data.

At the professional level, a good academic record in mathematics and the physical sciences is helpful for positive prognoses in any of the strictly mechanical fields, although these may have little bearing on such professional occupations as concert violinist and sculptor. In addition, it is well to establish the presence of an appropriate vocational interest pattern. At the technical and skilled levels the academic record becomes somewhat less important in so far as the college-preparatory subjects are concerned. Shop courses, including drafting and mechanical drawing, may be much more important. For the technical and skilled worker, quality of product becomes important. As is true in art or music, we can here say, "Let's see what you can produce" Production may be represented by drawings, ideas, or products considered to be indicative of mechanical skill at the level in question

Prediction of success at the skilled level in the mechanical field often is more difficult than at the professional and technical levels One reason is that, as we move down the scale of ability, there is a tendency for less differentiation among and between the duties attached to occupational labels. In the mechanical field more stress must be placed on the manual dexterities and coordinations than was true at the higher levels. Eye-hand, eye-hand-tool, and various gross-muscle-group coordinations become more important We are now predicting with fair accuracy the degree of suc-

cess with various kinds of material treated with different types of tools. Concrete objects are the final product and the best predictive device. Because standardized tests of mechanical ability and aptitude have been so widely publicized, and because many of the performance tests are gadgets which impress, there is no need here to devote further space to the measurement of mechanical aptitudes and abilities. This subject, within the limitations suggested herein, has been treated extensively in the literature.[18] Those who wish to do testing in the field of mechanical aptitudes, abilities, and interests will discover much of the pertinent material in these references.

Social ("Intelligence") Aptitude and Ability

How well does your counselee handle his personal relationships and in what ways does he manage them? Does he like people? Do people like him? How many of them? Of what sort? Do they admire him because he seems strong and bosses them, tells them what to do? or because he flatters them? or because he is friendly but objective and does not interfere with them? Is he a "lone wolf"? a leader or a

[18] Readers will find the following sources good points of departure for information regarding tests of mechanical aptitudes, abilities, and interests.

Bingham, *op. cit*, pp. 110–141, 170–177

Darley, *op. cit*, pp. 109–112.

Paterson, Elliott, *et. al*, *op cit*

Paterson, Donald G., Schneidler, Gwendolen G, Williamson, Edmund G. *Student Guidance Techniques.* New York· McGraw-Hill Book Company, Inc., 1938. Pp. 222–242.

Strong, Edward K., Jr. *Vocational Interests of Men and Women* Stanford University, Calif : Stanford University Press, 1943.

Super, Donald E. *Appraising Vocational Fitness* New York. Harper & Brothers, 1949 Pp. 184–297.

Traxler, Arthur E. *Techniques of Guidance.* New York: Harper & Brothers, 1945. Pp 50, 60–61.

Viteles, *op cit*, pp. 225–244

follower? or a mixture, sometimes aggressive, sometimes yielding and sometimes going it alone? Does he talk most of the time, or does he listen? Do friends rally round when he is in trouble, or desert him like the proverbial rats from a sinking ship? When he is under pressure and tension does his behavior toward people change to snarling at them, or does he grow more gentle and understanding? These and a hundred other questions raise themselves when we are concerned with individual and important differences in how our counselees deal with people. The way in which they manage these relationships with others is one of the vital indices of potential success, failure, or mediocrity in school and college and on the job.

One of the most asinine, damaging, and confusing errors that a counselor can make is to assume that there is only one kind of effective social "intelligence" and that this kind is one which "wins friends" and enables its possessor to "influence people," that the more "socialized" his counselee is the better for him at all times, under all circumstances, and in all occupations, and that the main purpose of dealing skillfully with other persons is to exploit them, control them, derive benefit from them. It is, from the point of view of the psychologist who is a clinical counselor, by no means so simple as that The experienced counselor knows that some tasks, such as certain types of military command, of politics, and of business management, demand that kind of operational social ability But he knows also that there are other occupations of high order such as creation in the arts, or research in the library or laboratory, that demand *asocial,* or occasionally, even *antisocial* attitudes and practices and isolation from most people in order to concentrate on the job in hand He knows that there are still others, such as pastoral ministry, missionary work, some aspects of social service, the teaching of small children and of the handicapped, nursing, and the like, that demand the utmost in the sacrifice of any predatory intent in favor of service with little thought of reward. We find that the authorities are in agreement on

many points in considering social intelligence. Before considering its nature in detail, four generalizations are presented as an approach to understanding. These are

1. *Social intelligence is not a unitary trait, although it may be a generalized trait.*

2. *Social intelligence is not a synonym for personality.*

3. *Social intelligence appears to be more loaded with environmental factors and learning than with heredity.*

4. *Social intelligence is not composed of a number of responses which invariably occur when similar situational stimuli are presented.*

E. L. Thorndike[19] is generally given credit for positing the existence of a social intelligence in his division of intelligence into *abstract, mechanical,* and *social* areas. He defined it in terms of understanding and managing people. Cisney[20] expanded this earlier definition by adding the phrase, "to act wisely in human relations." Gordon Allport[21] considered the concept in some detail in his 1937 book, *Personality: A Psychological Interpretation.* On page 407 he states:

> But it is obvious that "social intelligence" cannot be an inherited capacity to the extent that abstract and mechanical intelligence may be. It is rather a *trait* developed through opportunity and through interest, upon the basis of a native general intelligence.

On page 426 he gives further clue to the complexity in saying.

> There is no doubt that social intelligence is a generalized trait. Entirely different types of behavior may be called for depending on circumstance, and a flexibility in shifting from

[19] Thorndike, E. L. "Intelligence and its uses," *Harper's Magazine,* 1920, 140 227–235

[20] Cisney, H. N. *Classification of Occupations in Terms of Social Intelligence, Artistic Ability, and Musical Talent.* M A thesis on file in the University of Minnesota Library, 1935.

[21] Allport, Gordon W. *Personality· A Psychological Interpretation* New York: Henry Holt and Company, Inc, 1937. Pp 407, 426.

one to the other is the very essence of the trait In an American home a tactful gentleman chooses an uncomfortable sofa, if by doing so he leaves the more comfortable chairs for the ladies, but in Germany he learns quickly to avoid the sofa, however uncomfortable, for it is the seat of honor reserved for elderly matrons In America he escorts a lady on the side nearest the curb, in Europe he will walk on her left. In an Eskimo's home he will belch heartily to show appreciation of a satisfying dinner, on Beacon Hill he will not Social intelligence is not a matter of performing one act on all occasions, but of varying (even reversing) behavior to accord with circumstances For this reason it is absurd to regard social intelligence as a congeries of specific habits

The Minnesota Occupational Rating Scales follow Cisney's definition, but differ somewhat in describing the levels of the trait, or ability. Robert L Thorndike and Saul Stein,[22] summarize their review of the attempts to measure social intelligence as follows:

Whether there is any unitary trait corresponding to social intelligence remains to be demonstrated. It may be that when the contributions of abstract intelligence (or of various of the factors which make up abstract intelligence) and of interest in people are removed there will be nothing left It may be that social intelligence is a complex of several different abilities, or a complex of an enormous number of specific social habits and attitudes.

As with other traits, aptitudes, and abilities, our attempts to understand social intelligence must be made from an eclectic and therefore fragmentary view, no matter how much we may want to use it as a whole. Hence, we try to tease out specific items of behavior which are helpful in demonstrating social efficiency. Examples of this approach are found in popularized presentations of "the road to suc-

[22] Thorndike, Robert L, and Stein, Saul "An evaluation of the attempts to measure social intelligence," *The Psychological Bulletin*, 1937, 54 275–285.

cess" and of "how to manage people." Wendell White and Donald Laird[23] exemplify writers who have attempted to supply definite techniques for dealing with others in social and business interests. There is a prolific and growing literature in advertising, propaganda, and public-opinion analysis, much of which is aimed at the same goal. In most of these the line between predatory and social service interests in the presentation of these "canned," but sometimes effective, methods is thin or vanishes.

For the purposes of the educational-vocational counselor, it may be useful to sketch here some of the broad patterns of modern thinking about social intelligence and its operation before we get into some of the aspects of research and application to training and to jobs. Karen Horney,[23a] out of her wide study and experience in psychoanalysis, views all human beings as beset from the cradle to the grave by a "basic anxiety" which is made up of "loneliness" and "fear" in a "dangerous" and "hostile" world. To ease this basic anxiety we build, she says, three modes of defense behavior:

1. We move toward people. We fight our loneliness, gather our courage by surrounding ourselves with loved and loving ones, with friends, with acquaintances, who mitigate our sense of isolation and upon whom we feel we can count in the pinches. This is what is described inaccurately in the older literature as the "herd instinct."

2. We move against people. We recognize that the world about us is in fact dangerous and much of it hostile, and we, therefore, strengthen and arm ourselves to meet it in battle. We adopt the philosophy of "the survival of the fittest." We accept life as being competitive. We enjoy a scrap We want to be superior, to command, to lead, to boss, to over-

[23] Laird, Donald A. *What Makes People Buy.* New York· McGraw-Hill Book Company, Inc , 1935

White, Wendell. *The Psychology of Dealing with People* New York The Macmillan Company, 1941

[23a] Horney, Karen *Our Inner Conflicts* New York. W. W. Norton & Company, Inc., 1945. Pp 41–47.

come and conquer others and to use them for our own ends. We are not alone because we have our troops, our organizations, our unions, and our committees to surround and support our leadership We are not afraid, that is, not much, because we are more powerful, more farseeing than most

3. We move away from people We accept loneliness as a good and normal state because it keeps us out of struggle It also keeps us free from intrusion into our private lives by those who would lean or be parasites upon us We "live alone and like it." We are self-sufficient. People, parties, social contacts do not use up our time and our energies which we want to employ in reading, writing, painting, composing music, culturing bacteria in our laboratory, or smashing atoms in our cyclotron We "avoid all entangling alliances."

Horney implies that persons of the highest order of social intelligence are those who have learned all three of these techniques and know when, how, and how much to use each of them. They lean on others when the leaning is good They fight when a battle is necessary, and they run away when withdrawal or flight is indicated. Few, however, reach this maturity of social intelligence. Most people predominantly follow one of the three methods of social adaptation. If, in so doing, they do not carry it to the extreme of compulsive neurosis, the specific one of the techniques they follow becomes one of the most important indices to a counselor of the counselee's vocational potential.

This is true on the one hand because social service jobs such as teaching, social work, ministry, general medical practice—particularly in rural areas—and the like demand workers who are primarily "movers toward people," who are characterized by such descriptive adjectives as "sympathetic," "humanitarian," "unselfish," etc. Success in performance of these tasks requires that they work constantly and warmly with others, win their affection, exert little or no coercion upon them. On the other hand, competitive business, industrial, political, and military jobs are successfully carried out only by the predominantly aggressive, the

pushers, the scrappers, the men and women who "get things done despite hell and high water." They move against people who are in the way of their accomplishment. They coerce, they command, and they control and manipulate by any means, from cajolery and persuasion to sheer force Still other occupations can be performed well only by those who move away from people, the accessioner and cataloguer in the library, the file clerk who spends his days alone in the long dim aisles of cabinets full of papers, the lighthouse keeper on a wind-swept isolated promontory, the composer of symphonies, the scholar in his study and the scientist intent on a long-drawn experiment, and the fighter pilot speeding through the substratosphere. In view of these concepts it is obvious that a counselor must not assume that the aggressive, apparently socially intelligent counselees are "well adjusted"; that the sensitive, kindly ones need to be made "tougher"; nor that those who are "shy" and "introverted" need to be converted into bullies.

Still other broad concepts, useful in structuring the counselor's thinking about and clinically applying the factors of social intelligence, are those of Allport[24] and Vernon emerging from their long experiments with their Scale of Values Following Spranger's *Types of Men* and in accord with some contemporary theories of conditioning, figure-ground, and dominance,* these researchers built a scale posited on the assumption that our individual and social behavior is structured by the values we attach to one or another way of life, thought, and emotion. Adapting Spranger they construct the following archetypes: (1) The Theoretical Man, whose basic drive is the search for facts, for truth. In general, he is the scientist. He is cold toward unsubstantiated opinion. He rejects feeling. He asks always: "What are the facts?" His social behavior may be blunt, unsympathetic, analytical

[24] Allport, Gordon W., and Vernon, Philip E. *A Study of Values Manual of Directions* Boston: Houghton Mifflin Company, 1931.

* See especially Murphy, Gardner *Personality*. New York. Harper & Brothers, 1947. Particularly Chaps. 8, 9, and 12.

dominate the thinking and feeling of a counselee, and which may be validly and reliably measured in the Allport-Vernon Scale, give strong evidence of potential success or failure both in academic work and on the job * In school it is common for students of low measured aesthetic values to do poorly in courses devoted to art, music, and poetry and to misunderstand and reject association with students who are avidly hungry for aesthetic experiences.

Another concept concerning social intelligence which the educational-vocational counselor must continually explore is that individuals vary tremendously in their social behavior as between dealing with people in a one-to-one, face-to-face situation and in exercising persuasive or coercive power over large numbers. That one is highly effective as an individual salesman, office receptionist, a private tutor or teacher of a small class, or a chairman of a committee where interpersonal relationships are direct and close does not at all mean that he can be equally compelling in the use of mediums of mass communication when he speaks from the public platform, from the pulpit, or over the radio, acts upon stage or screen, or writes advertising or commentary or "best sellers" that move great masses of folk. Millions have been moved to feel, think, and act on a world scale by such masters of radio as Franklin D Roosevelt and Winston Churchill Other millions have been impelled to buy soaps and ciga-

* A delightful illustration of this is the case of a college student known to the authors, who rather strongly fitted the Allport-Vernon Social Man and the Horney mover toward people. To help out his college finances, he undertook to sell a new gadget to restaurant keepers in a large city He worked hard at it all one summer. At the end, he knew most of the restaurant men well, he knew a lot about their families, their problems, their hopes, and their ambitions, he was warmly friendly with many of them, and he had cleared a net profit of $75 for three months' work. His college classmate and friend, who fairly well typified the Economic Man and the mover against people, attempted to sell the same device in another town. At the summer's end he knew little or nothing about his customers, but he had cleared more than $1,000 and his expenses

rettes by the "socially alluring" voice of a broadcaster speaking the words of a "socially intelligent" copy and script writer, neither of whom is known to any of his hearers.

If we consider the matter of degree of coercion in the exercise of social intelligence, we find that persuasiveness becomes less necessary if there is an actual or implied threat held over us. Thus, while teachers need above-average social intelligence, the fact that they can resort to disciplinary action requires that they need less smooth persuasion than the real estate agent, who cannot penalize a customer for not buying a lot or a house. The physician has the implied threat of serious illness or death if his advice is ignored The lawyer, unless he is pleading before a jury, has a club in terms of the consequences of going against his judgment The military officer has the menace of court martial, guardhouse or brig, or Federal prison enforcing every order he issues, and policemen, in dealing with the public, have to be trained to distinguish cases in which persuasion should be used from those where coercion is mandatory. There is much food for thought for the counselor in Thornton Wilder's[25] analysis put in the words of Julius Caesar. He takes the position that all of us are constantly torn between a deep desire for unlimited, unrestricted freedom to do what we want to do, and a contrary powerful fear of the consequences of being free He makes clear that, in our relationships with people, we therefore tend to resent or even to hate those who threaten to restrict and coerce us and, alternately, to admire or love them because they relieve us from responsibility for making decisions and taking the consequences. This basic theory may explain much of why students do not get along with teachers and employees with bosses. It may be assumed that high social intelligence would enable one to recognize this conflict in oneself and would lead to adaptation and adjustment in school or on the job

Much research has recently been done and is continuing

[25] Wilder, Thornton *The Ides of March* New York. Harper & Brothers, 1948. Pp. 218, 238.

in another aspect of the operation of social intelligence and its development in the studies carried on by Lewin, Lippitt, Bradford, and others in group dynamics, first at the Massachusetts Institute of Technology and now at the University of Michigan. In essence these are full-scale experiments to study how individuals can learn to behave to make democratic group work most effective, to solve community, state, and national organizational problems They range from small committees, dealing with practical matters of how to get something done, to large conferences on high policy. Their findings in the techniques of organizing and the tools of training for group social action already appear significant for counselors and educators, for employers and government workers, and the reader is strongly advised to keep in touch with the literature and reports in group dynamics

Levels of Social Ability

How important the type and level of social ability may be is indicated by the fact that many studies of why people have been fired from jobs show that the large percentage have been discharged, not for technical incompetence, but because of personality difficulties. This has usually meant ineptitude or failure in interpersonal relationships with bosses, fellow workers, and subordinates. A statement of the useful levels of social intelligence of some types in some occupations is presented in the Minnesota Occupational Rating Scales. The top level is there represented as being characterized by face-to-face situations in which the person possessing and demonstrating an unusual degree of this trait shapes the behavior of others in desired directions by persuasion and without resort to force, actual or implied Some politicians sometimes meet this criterion. The life insurance salesman, selling an expensive service with no benefits to the insured except a feeling that his family will be taken care of when he dies in the presumably remote future, is a good example of a worker whose success depends upon an unusually high level of this kind of social ability

Managerial positions and professional occupations which give the individual a measure of power over others are rated at the second level. These require, as a minimum, less of the benign noncoercive social ability than do occupations included in the top level. Persons in managerial positions have the power to affect future employment, job status, and income. Under the velvet lies steel As has already been mentioned, the military officer, policeman, physician, lawyer, and teacher have varying degrees of dictatorial power which can be invoked to help them to control our behavior with or without resort to persuasion

An average amount of social ability is needed in many occupations at the third level For example, the vast numbers of retail salesmen and reception-desk clerks fall in this category. The filling-station operator depends on pleasantness to customers to maintain or increase his sales.

Many occupations, as has been suggested, require no extensive or important social contacts and make few demands in this direction other than just being able to stay out of trouble arising from social conflict Watchmakers, research workers, file clerks, library cataloguers, lighthouse keepers, and often artists can be asocial if they wish and often must be so to do their tasks well. Their jobs are seldom in jeopardy because they are inept in persuading or managing people.

Estimating, Judging, and Measuring Social Aptitude and Ability

Although the importance of social ability is clearly recognized, we have thus far been able to accomplish surprisingly little in its quantitative or qualitative measurement for general clinical counseling. This is partly because of our failure to reach a clear understanding of the complex nature of the generalized trait or traits in question, and partly because reliable and valid tools and techniques for estimation and measurement are few and crude While it may be solidly assumed that social behavior is less strongly weighted with

heredity than many other aptitudes and abilities, and hence is more susceptible to improvement through training, our educational system has done much less to set up effective learning situations for its development than for other abilities less amenable to schooling. We put great stress on English, mathematics, and science, although these are mastered by use of academic ability or abstract intelligence, which is behavior generally thought to be quite heavily loaded with hereditary factors. Our problems also are difficult in discovering aptitudes for social efficiency because research in the field has left somewhat of a hiatus between the nursery school age groups and the young adult.

Child psychologists such as Anderson[26] have given us insights into how social behavior develops in small children They also indicate the importance of early experiences and describe techniques in developing ways of behavior in group situations which are socially acceptable and personally satisfying. Unfortunately, we do not have longitudinal studies of the growth of social intelligence which carry through the elementary and intermediate grades into secondary school and college. The methods of observation which work well with the child are probably inappropriate with older subjects, and we do not as yet have equally good tools and techniques for studying the social behavior of the adolescent and young adult.

Among the devices which indicate aptitude for dealing with people are the Allport-Vernon Scale of Values and the case study judgment of dominant ways of reaction as described by Horney and summarized in this chapter. These are "guess who" and sociogram[27] techniques suggested in Chap. 5. Evidences of peck order,[28] specific indices of leadership in various types of activities, and the tendency to

[26] Anderson, John E "*The development of social behavior,*" *American Journal of Sociology*, 1939, 44·837–857.

[27] Bronfenbrenner, Urie "The graphic presentation of sociometric data," *Sociometry*, 1944, 7 283–289

[28] Murphy, Gardner *Personality*. New York Harper & Brothers, 1947 Pp. 574ff.

join and be accepted, versus isolation and rejection, all are important if we can obtain valid and reliable observation and recording so that meaningful data are available to the counselor as the counselee becomes older Such a longitudinal record would afford us an opportunity to attempt remedial work while there is a chance for worth-while gains to the counselee through programs in educational institutions, designed to make changes more important than, for example, the improvement of poor study skills in science or foreign language!

Because we do not have longitudinal studies and because ratings of social intelligence have not always yielded satisfactory reliability and validity, many attempts have been made to devise tests of social aptitudes and ability Thorndike and Stein[29] reviewed these attempts up to 1937. They concluded that measurement of "ability to deal with people" had not been satisfactorily accomplished up to that time. Although these writers refer to the attempts to measure social aptitudes and ability through interest and attitude questionnaires, they do not introduce pertinent materials from the Strong Vocational Interest Blank Studies of the Kuder Preference Record since then have thrown additional light on the use of interest inventories as tests of these aptitudes and abilities for the purpose of selecting salesmen. Various investigators have found that successful life insurance salesmen were differentiated from men-in-general by their high scores on certain scales of the Bell Adjustment Inventory (Adult Form), the life insurance scale of the Strong Vocational Interest Blank, and the persuasive scale of the Kuder Preference Record. This occupational group, which is generally considered to be possessed of unusual persuasiveness and a particular type of social ability, was markedly different from the groups with which it was compared relative to measured social aggressiveness. Other studies of the selection of salesmen give the same results.[30]

[29] Thorndike and Stein, *op cit*

[30] Hahn, Milton E. *Social Intelligence in a Distributive Occupation.* Ph.D. thesis on file in the University of Minnesota Library.

For all these reasons, the user of personality questionnaires should be extremely cautious in their interpretation, since no instrument of this type as yet devised gives clear, single, and unequivocal results, as is shown by the review of personality questionnaires by Albert Ellis.[31]

The high school and college counselor must depend primarily on interview, autobiography, activity records, observation, and test results, all pooled and weighted, to make his judgments as to the quantity and quality of social aptitude or ability present in a given counselee. These data, combined with cautious use of personality inventories, must be clinically interpreted to determine strengths and weaknesses in social effectiveness. One thing is certain, we do not have at this time any short cuts which will give us even approximate answers in judging the aptitude for, or ability in, handling human relationships wisely.

Clerical Aptitude and Ability

The efficient recording of information such as dates, names, addresses, places, persons, activities, movements, sums of money, bills, accounts, descriptions, and hundreds of thousands of items about people, events, and things and the maintaining of these records in orderly fashion for ready reference provide work for millions of men and women the world over. They are a major aspect of man's attempt to profit from what has gone before, to know what has been done, to build present and future upon the successes and mistakes of the past in all his activities. So great has grown the flood of paper records that some viewers-with-alarm hold that our civilization may be drowned and buried by it. The documents of the American government's civilian and armed services in World War II alone are said to be enough to stack the entire Pentagon building in Washington to the

[31] Ellis, Albert. "The validity of personality questionnaires," *Psychological Bulletin*, 1946, 43·385–440.

roof. Vast numbers of persons devote their adult lives to typing, sorting, filing, digging out and refiling, mailing, receiving, copying, summarizing, indexing, eliminating, and destroying clerical stuff. It is, therefore, important that the educational-vocational counselor know as much as he can about the aptitudes and abilities labeled conveniently, and oversimply, "clerical."

Like other abilities treated in this book, clerical ability is no simple, single trait but is, on the contrary, a complex configuration of aptitudes, attitudes, skills, and interests. One of its basic elements is the ability to make rapid accurate discriminations of minute differences and similarities in the order of numbers, of letters, and of words. A person with low-order ability in this field would frequently confuse, while one of high order would almost never mistake, the following:

John L. Johnson,
3232 North Western Ave.
S. Pasadena, California

and

John I. Jonson,
3232 Northwestern Ave
N. Pasadena, California

While to the uninitiated this may seem of minor importance, in fact it may involve serious matters of even life and death Confusion of the two may mean that one gets the other's month-end bills. A reporter may publish a story accusing Johnson, who is a respected banker, of committing a murder done by Jonson, a known criminal. Or Jonson may be drafted into the army, despite his essential deferment, while Johnson is deferred for many months. Or Jonson's checks may be deposited to Johnson's account. Many lives have been fouled up by persons of low clerical ability.

Added to this power of fast and accurate discrimination of minutiae are many other related requirements, the particu-

lar combination needed depending on the nature of the job to be done. Usually these include a fair mastery of the mechanics of English, spelling, punctuation, and grammar which, in the case of the highly paid top administrative secretarial position, may extend to the power to write clear, fluid, creative letters and reports out of the boss's few rough notes. They include also a sound working knowledge of the specialized vocabulary of the field in which one works, so that errors will not be made such as that of one clerk who wrote "geneology" when her doctor employer dictated "gynecology." Of equal importance is skill in arithmetic, for a slip in addition or subtraction might mean the sending of half the needed men into battle or result in the loss of $1,000 to a businessman because of an error in price quotation. Mechanical ability in combination with these mentioned is of increasing demand, as machines such as stenotypers, addressographs, comptometers, billers, scorers, microfilm and other photographic reproducers, and analyzers are more and more substituted for hand operations. Listening and speech skills are required for those who must use dictating instruments. Social intelligence is a must for those whose clerical tasks include their meeting customers, clients, and colleagues of the employer. Further, in all cases, there is needed a measured interest pattern congruent with whatever combination of these components of clerical occupational behavior is demanded by the job. Finally, it is obvious that various levels of academic intelligence must be present with clerical ability if the possessor is to function in particular kinds of clerical tasks.

In considering the nature of clerical aptitudes and abilities, W. V. Bingham[32] credits Marion A. Bills with the following description of what the clerical worker does "Clerical duties in a modern office . . . include the gathering, classification, and preservation of data of all sorts, and the analysis and use of these data in planning, executing, and determining the results of operation."

[32] Bingham, *op cit.*, p. 143.

Donald Super,[33] taking a position contrary to that of the authors, defines clerical aptitude in terms of a relatively unique trait, quite restricted in nature.

> There appears to be only one aptitude, in the strict sense of the word, which is important in clerical work, is of little importance elsewhere, and might, therefore, be thought of as "clerical aptitude." This is number discrimination. . . . The ability to do this is little affected by training or experience in clerical work, or by age in adolescence or normal adulthood: it is relatively independent of [academic] intelligence.

The Minnesota Occupational Rating Scales[34] supply a definition of clerical work which is "By clerical ability is meant the ability to do rapidly and accurately detail work such as checking, measuring, classifying, computing, recording, proof reading, and similar activities." Lennon and Baxter[35] constructed a check list of 90 statements concerning the duties of clerical workers. This check list affords insights into the factors included in clerical aptitudes and abilities. They found that they could predict from test scores the performance relative to such factors as understanding of work, errors in performance, quantity and speed of work, performance of multiple tasks, and unnecessary duplication in work effort.

Levels of Clerical Aptitude and Ability

The top level of clerical ability includes occupations of a professional or highly technical nature. The accountant, actuary, statistician, and administrative secretary are workers in whom are combined rare patterns of these abilities at the top level The level is high also in academic ability. Although a college degree is not, as yet, always insisted upon to enter these occupations, one must come from the upper reaches of those with college ability to compete success-

[33] Super, *op cit*, p 68

[34] Paterson, Gerken, and Hahn, *op cit*, p 21.

[35] Lennon, Roger T, and Baxter, Brent. "Predictable aspects of clerical work," *Journal of Applied Psychology*, 1945, 29.1–13.

fully with workers in these occupations. As has been pointed out by Strong, Darley, and others, professional-level interests of a particular patterning are necessary if one is to be satisfied and happy in this field.

The second level of clerical ability includes those workers with high school or junior college academic ability and, usually, training. Bookkeepers, stenographers, and operators of complex business machines are examples of the job outlets for clerical workers at this level.

The average, or routine third-level, clerk works at jobs such as filing, order clerk in a wholesale house, and mail sorter in a business establishment. Large numbers of people have sufficient clerical aptitude and ability to learn such duties or to perform them without extensive training Jobs in the clerical field at this level are frequently threshold occupations for young workers, ceiling jobs for older workers, or incidental accompaniments to the duties of retail sales clerks and others in similar work.

Estimating, Judging, and Measuring Clerical Aptitudes and Abilities

Because of the range of their usefulness, the educational-vocational counselor must judge, estimate, and measure clerical aptitudes and abilities in the majority of his counselees, no matter what may be the policy of the school or college where he works Some educational institutions consider clerical skills—such as typing, filing, and classifying—as tools essential to normal daily study, as well as to many occupations, for most students, while other institutions will have nothing to do with any of them since they consider these things as below the college or university level and as having no relationship to ivory-tower academic concerns Some institutions maintain extensive commercial curriculums, others have only theoretical economics departments Hence if the counselor is charged with weeding out those who cannot profit from theoretical instruction his task is quite different from the one which confronts him in the se-

lection of students who may successfully major in the practical commercial curriculums. Because so many factors must be considered, no short test or test battery will tend to yield satisfactory results.

Barrett[30] reports an interesting study regarding the selection and counseling of liberal arts college students who wished to add clerical skills as job insurance, for fear that the general academic education would leave them vocationally handicapped. Selection was considered necessary because without it many students would ask for the work who could not profit by it enough to justify the effort and expense. She discovered that, by use of a test battery, she could make worth-while differentiations for that purpose between and among the students who would profit most and least College grades in the clerical courses were used as the criterion of achievement This study disclosed that number and name comparisons, tapping, dotting and copying, transcription of materials, spelling, and scores on an interest inventory aided appreciably in selecting those who would tend to profit from a course in shorthand. The number section of the Minnesota Vocational Test for Clerical Workers, and the tracing, dotting, and pursuit sections of the MacQuarrie Mechanical Ability Test were useful in selecting those for whom success could be predicted in typing.

Although test results can be helpful, counselors collecting data for aiding counselees to consider a career in the clerical field should, of course, make judgments from several types of data. Among these are

School grades—particularly the mechanics of English and simple arithmetic

Scores from tests of academic ability

Tests of clerical aptitude—number and name comparison, speed and accuracy in work samples closely related to routine clerical tasks

[30] Barrett, Dorothy M "Prediction of achievement in typewriting and stenography in a liberal arts college," *Journal of Applied Psychology*, 1946, 30 624–630.

Tests of clerical ability—typing, filing, and machine operation for those with some training and experience

Tryout experiences—through business training, and typing for personal use, pitched at the appropriate school level

Investigation of vocational interests in the attempt to identify those for whom the clerical field appears a suitable occupational terminal

Estimates of social intelligence important to many clerical jobs at various levels.

The counselor should also be aware in his diagnosis and prognosis that, except for the professional and higher technical levels, this is a field largely dominated by women. The shift in the clerical field from hand to machine work must be kept in mind, and rapid development in such areas as statistics should be noted because new occupational outlets arise constantly out of such changes To be aware of these outlets and of the training institutions where a high clerical aptitude counselee can get training on elaborate and costly machines, which are beyond the resources of the average school, is one of the duties of the competent educational-vocational counselor. Sometimes such specific training may be acquired in a commercial school or in a manufacturing concern which makes special clerical equipment. Obviously, there is much more to estimating, judging, and measuring clerical aptitudes and abilities than merely assigning a student who is having trouble with the academic courses or who "wants something practical" to the commercial curriculum to sink or swim.*

* Additional information regarding clerical aptitudes and abilities will be found in these references·

Bingham, *op. cit.*, pp. 142–165.

Crissey, William J. E., and Wantman, M. L. "Measurement aspects of the national clerical ability testing program," *Educational and Psychological Measurement*, 1942, 2.37–46

Ghiselli, Edwin E "A comparison of the Minnesota Vocational Test for Clerical Workers with the general clerical battery of the United States Employment Service," *Journal of Applied Psychology*, 1942, 2.75–80

Artistic Aptitudes and Abilities

In the early days of America, our people were, in general, so compelled to pioneering in building the nation, exploring the West, exploiting our natural resources, and organizing our economic, political, and social structure that they had little time for or interest in artistic activities. Our ancestors, for the most part, also were steeped in a Puritanism that looked upon most such activities at best as a waste of time, at worst as deeply sinful. The rugged pioneer looked upon the musician, painter, dancer, actor, or writer as a "long-haired" and effeminate idler. The Puritan looked upon these as "immoral." Parents hung their heads in shame if one of their children persisted in exercising an aesthetic talent. In consequence, job outlets in the arts were few, employment uncertain, and pay poor. In the past fifty years or so, however, an extraordinary change has taken place While the pioneer-Puritan attitudes still persist in some quarters, they have largely been swept away by scientific and technological developments which have exchanged machine for muscle power, vastly extended the leisure time of our people, stepped up communications, and thus released immense quantities of creative energy and the capacity to appreciate its products High-speed printing has created a vacuum that can only be filled by increasing numbers of poets, novelists, and story and feature writers, devoting their lives to training for and producing literature, and with them, thousands of photographers, painters, and designers to create illustrations and alluring advertising. Development of new construction materials, plus the swelling demand for housing, made it necessary to build curriculums, departments, and schools of architecture, interior dec-

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Paterson, Donald G., and Darley, John G *Men, Women and Jobs*. Minneapolis University of Minnesota Press, 1936.

Paterson, Gerken, and Hahn, *op. cit.*, pp. 20–25, 88–93.

Paterson, Schneidler, and Williamson, *op cit.*, pp. 205–209.

Traxler, *op. cit.*, pp. 62, 94–95.

oration, and many auxiliary services to make modern homes more beautiful. The growth of radio, motion pictures, and television as entertainment for the peoples of the world has opened up great areas of aesthetic production to hundreds of thousands of workers, with monetary rewards sometimes equaling those of the highest paid business and industrial executives. Radio and phonograph recording have brought a flood of new occupations for writers, actors, musicians. Television will obviously again extend employment in the arts. And all this does not begin to tell the story.

In the face of this dynamic growth of outlets for people with artistic aptitudes and abilities, research in analysis of the many aspects of the field and in identification of the combinations of intelligences, traits, and skills that may go into the successful performance in one or another has been minimal The great majority of counselors think of occupations in the arts only when some counselee or other puts up to them the question "How do I break into the movies?" or "What chance is there for me in radio?" or "How about commerial art?" or "What are the opportunities in professional dancing? or the legitimate theater?" So alien have these questions and all that they imply appeared to be to "respectable" academic pursuits in school and college and to "practical" ways of making a living in business, industry, and the prestige professions, that it has been all too common counseling practice to shove these and similar questions aside and persuade the counselee, eager to shape his life plan around an artistic core, to abandon his ambition and turn to something more usual and conventional. In this evasion, counselors have been assisted often by the parents and friends of the counselee, whose thinking and feeling about jobs in the arts is still colored by the cultural hangover of Puritanism and pioneering.

While sounder patterns of approach to the problem must await much experimental research as well as clinical investigation and expanded occupational information, the authors consider it important to indicate briefly here some

of the general lines along which the general clinical counselor might structure his consideration of the matching of tasks, talents, and training in the various artistic fields

Our first assumption is that most of the areas of operation of aesthetic intelligence may show, on critical examination, a four-phase differential division.

1. The first of these can be labeled, for convenience, *appreciation.* Appreciation seems to include primarily two elements. (*a*) interest, in terms of liking art or music or literature, of valuing them emotionally, and (*b*) the organization of the physiological multisensory systems of the body to receive and react to impressions of color, sound, movement, etc Study of this division of the field is important to counselors for several reasons. It gives them clues as to what courses in appreciation of art, music, dancing, theater, movies, and literature might profit a counselee, enrich and enliven his intellectual work in school and college, serve as needed relaxation and relief from tensions—both during his schooling and later on the job—and widen his opportunities for acquaintance and friendship with others of kindred interests. Common observation shows us clearly that, in general, competence in scholarship and in working for a living is increased by adequate amounts and kinds of appreciative activities, just as, at the extreme, intensive and extensive experiments with art and music therapy for neurotic and psychotic patients have demonstrated effective healing power in many cases.

2. The second category of operation of artistic abilities may be called *interpretation.* In this category we have the performers of all sorts. the pianist who skillfully interprets Mozart or Debussy; the dancers who interpret a classical ballet or *The Green Table;* the actors who, on stage, screen, or radio do *Hamlet* or *Abie's Irish Rose;* the teacher of literature who rouses his classes to enthusiasm by his reading and illumination of the meanings of poetry, prose, and drama. It can readily be seen that, while ability to interpret one or another art form is here basic, the combinations

of aptitudes, traits, and skills that go into each are quite different one from another. Dancer and actor may both need agility, but perhaps of different orders. The dancer needs no training in voice and effective speech, while the actor must have the most and the best. The pianist needs high-order manipulative mechanical ability, while the English teacher needs little or none It is clear from this brief summary that a vast amount of further study and research is demanded to define more sharply the constellations of abilities that go into each form of interpretation before general clinical counselors in educational institutions can do an effective job of helping counselees with these talents to find the courses of study and training and the occupational outlets for them.

3. The third important aspect of artistic aptitudes and abilities is the *creative*. Until comparatively recently, creative activity was conceived to be an untouchable, unanalyzable outflowing of genius in rare individuals unamenable to scientific study or to social or educational stimulation and control. In recent times, however, its nature and its dynamics have been subjected to increasingly careful scrutiny through interviews with successful composers, painters, poets, etc.; through observation of creators at work, through elementary school experiments with the release of creative energies by various progressive methods, and through projective devices and hypnosis. It is essential that the counselor familiarize himself with the literature in this expanding field if he is to deal effectively with many of his counselees and lend a hand to feeding into our culture a growing number of essential workers to keep the presses busy and to satisfy the demands of radio, movies, television, the stage, the concert hall, and the hundreds of other employers of people with one or another combination of creative abilities. It is not possible in the time and space allotted here to do more than sketch with utmost brevity some of the elements and characteristics of creative activity and, for the rest, to refer the reader to some of the more recent and fuller

treatments of it. Murphy[37] and Lowenfeld[38] appear to be the best general sources at this time for review. Murphy suggests that an individual may be identified as having aptitude for creative work by a high degree of sensitivity to a quite specific form of experience which is usually sensory; that he delights in these experiences, seeks more and more of them, is curious about their relationships, tries new combinations of them, and selects the most delightful to him; that this process results in a controlling drive and set of established habits. He sees the desire to create as almost universal but indicates that this desire is frustrated in one culture (see the above discussion of the pioneer-Puritan attitudes of earlier America) and released in another, depending upon whether society in its mores gives approval and status to the artist or withholds these from him. He points out that in each category of creative activity there must be a pattern of creative skills which, granted aptitude, must be built up to a high point of efficiency by continuous and persistent practice, and these must accompany high sensitivity We may, for example, "have in mind" a stunning and beautiful picture, but if we cannot mix colors, stretch canvas, or wield a brush the picture is stillborn. Murphy further points out the necessity of stimulating experience such as parental example, direction, encouragement, and sometimes coercion, such as, also, good teaching and watching "masters" at work. He sees as another factor the patience to polish and refine after the first "frenzy" of creation is set down in rough form, a corroboration of the old definition of genius "that it is an infinite capacity for taking pains." He suggests finally that the psychologists and psychoanalysts are now making new discoveries in the processes of association which may be of the utmost later practical importance in counseling.

[37] Murphy, *op cit*, especially Chap 19, "Creativeness," pp 452–478.

[38] Lowenfeld, Viktor. *The Nature of Creative Activity* New York Harcourt, Brace and Company, Inc., 1939

Lowenfeld, Viktor. *Creative and Mental Growth.* New York The MacMillan Company, 1947.

4. The fourth area of artistic aptitude and ability may be named the *analytical.* This appears to involve a combination of certain kinds of high academic ability with interest in and sensitivity to one or another form of aesthetic activity and its products. From people with these combinations, we get the scholars and researchers in literature, music, drama, and the rest. Especially we get the critics who write the newspaper and magazine columns on the concert, the movie, the exhibition of painting and sculpture, or books on the history of art movements or of individual artists and their contributions to the culture of a time or a people.

The further refinement of our understanding of these four general types of artistic aptitudes and abilities, of their application to each different kind of artistic occupational activity, and of the relationships among them is essential if sound counseling is to be developed in this field. It is clear that one may be a highly competent appreciator and at the same time be unable to interpret, to create, or to analyze. It is equally obvious that one may be an interpreter of high order but no creator or analyst. And, as history, as well as a survey of contemporary professional workers, shows, it sometimes happens that one man or woman combines all four abilities at high level in a field such as music, being at once an appreciator, interpreter, creator, and sound critic

Levels of Artistic Ability and Aptitudes

As with other areas of human interest, activity, and employment, not only does the concept of *field* apply but also that of *level.* In the field of appreciation of music, for example, we must consider both range and depth. In range, millions of Americans enjoy "popular" songs. They pick them up from radio and records, hum them to themselves. Millions likewise appreciate the seasoned favorites such as the well-known Christmas carols, "social" songs such as "Auld Lang Syne," and many another. Thousands thrill to symphony and opera. But many fewer thrill to chamber music. Some, in the "better" music prefer the classic,

some the "modern," composers. Few, however, have a range that covers the whole gamut from boogie-woogie and the "Basin Street Blues" to Wagner's "Ring" and Ravel's "Quartet." In interpretation, hundreds of thousands can thump out tunes on the piano for their own and their friends' amusement and pleasure. Many can earn a satisfactory livelihood playing for radio or local concerts, with perhaps some teaching on the side. Few attain the high professional level of a Paderewski or a Rubinstein, with world-wide prestige and very large income. The concept of level applies in all other aspects of aesthetic employment. There is, for instance, only one Disney, but hundreds of competent artists have worked for and with him, making first-rate incomes by drawing and filling in the transparencies from which his animated movies are made. For every professional architect there must be dozens of designers and draftsmen, for every best-seller novelist, a hundred pulp-magazine and house-organ writers, and for every top actor on screen, stage, or radio, there must be many minor ones. For each level of performance there is needed an equivalent level of aptitude and ability For adequate counseling in this field, we require a great deal more research, job analysis, and occupational information than we now possess.

Making and Expressing Judgments of Artistic Aptitude and Ability

As is obvious from the preceding discussion of fields of artistic activity in school and employment and of the levels of aptitude and ability applicable to them, making and expressing judgments in this area of counseling is an exceedingly complex and difficult matter. A number of approaches may, however, be suggested.

Tests which have been subjected to any considerable analysis for validity and reliability are found only in art and music and these few are definitely limited to measurements of a few factors. Best known of the art tests are two. the Meier-Seashore Art Judgment Test and the McAdory Art

Test. The former consists of 125 pairs of pictures, one of each of which was painted by a master and the other altered. The latter is made up of 75 quartets of pictures, each set of four on the same theme. In each case the one taking the test judges order of merit Since both tests are printed in black and white, the entire element of color is lacking Nevertheless, ratings on both tests, since there is a low correlation between them, are useful if the proper norms are used and the counselor is cautious in interpretation. A. S. Lewerenz's Tests in Fundamental Abilities in Visual Arts, while as yet not adequately proved out, offer some possibilities for further development, since he is attacking a number of specifics, such as (1) recognition of proportion, (2) originality of line, (3) observation of light and shade, (4) knowledge of subject-matter vocabulary, (5) visual memory of proportion, (6) analysis of problems in cylindrical, parallel, and angular perspective, and (7) recognition of color.

In music, the best known test is the Seashore Measures of Music Talents, which consists of an album of six records to which the testees listen and respond with pencil upon test blanks. There are two series, one for unselected persons and the other for musicians or would-be students of music. The test is designed to measure sense of pitch, of intensity, of time, of rhythm, and of timbre and tonal memory. Jacob Kwalwasser has constructed two instruments: (1) with G. M. Ruch, called a Test of Musical Accomplishment, designed to measure the achievement of elementary and high school pupils in a typical music course in learning musical symbols and vocabulary, ability to detect time and pitch errors in familiar tunes, etc.; (2) a Test of Musical Information and Appreciation, designed to judge combined academic and musical achievements in a typical high school or college course in appreciation of music. It deals with composers, types of musical works, musicians, their instruments, and the tone production of each, and with musical forms.

Supplemental tests of value in making judgments of artistic ability for counseling purposes would certainly include rating on the Aesthetic Scale of the Allport-Vernon Scale of Values, the measured interests on the scales for Artist and Musician on the Strong Vocational Interest Blank; compared with the results on the Art, Music, and Literature scales of the Kuder Preference Record.

To these should be added all pertinent materials from the case history, the autobiography, and such interview probing as may be indicated. If the counselee's total picture suggests the wisdom of his undertaking training in one or another artistic field, further factors should be considered, depending upon the field and level. For example, some of the mechanical ability tests may be necessary, not only to get measures of space relationships for the plastic and graphic arts and architecture, but also to give some index of hand and finger skill if the art requires the playing of an instrument or the manipulation of sculptor's tools or paintbrushes Some assessment of the counselee's agility must be made if his aim is to dance professionally or to act for stage or screen. Measures of academic intelligence and special abilities may serve to determine either type or level to be sought. And finally estimates of kinds and degree of social intelligence must be made, since the high-level practice of some of the arts requires a dominantly withdrawing personality, while in others considerable social skill is needed. In the light of all this it is clear that the general clinical counselor has an increasing responsibility to identify aesthetic intelligence, latent artistic aptitudes, and present abilities if he is to serve many of his counselees and is to meet the growing demand in the employment market for persons with many varieties of talents.

Chapter 8. EDUCATIONAL–VOCATIONAL INTERESTS

Interests

The fundamental reason why general clinical counselors and researchers in personnel work have devoted increasing attention to "interests" lies in widespread common observation of workers in different fields. Such observation reveals simply that, granted the presence of abilities commensurate with the demands of the job, workers are successful, happy in, and satisfied with their jobs if they feel at home and at ease with the things they have to do and with the people with whom they have to work. This feeling of at-homeness arises from having strong and large areas of common interests which spread far beyond the borders of on-the-job behavior. It is easy to see that, for example, if we move among a group of preachers who are deeply satisfied with their work and effective in it, they are individually and as a group characterized by generally similar behavior, feelings, attitudes, speech habits, reactions, and ways of viewing the world. They not only concern themselves with the business of pastoral work, with the preparation and delivery of sermons, with the raising of money to pay their salaries and to build new churches and extend their services, but they tend to act, think, and feel, in most areas of activity, like one another. They prefer much the same types of leisure reading, the same kinds of sports and games, the same sorts of jokes and stories, music, travel, friendships, etc. If, as observers, we move suddenly from association with preachers to hobnob, say, with horse-racing stablemen,

liquor salesmen, or ballet dancers, we are struck at once by the marked differences in the interests of each group. We may readily and quite accurately conclude that a successful worker in one of these occupational sets would indeed feel like a fish out of water if he attempted to carry on the job of another. A preacher, for example, might have all the fine build, muscular coordination, sense of rhythm, and timing of a potentially great ballet dancer but his interests would wholly inhibit him from trying to be or succeeding in becoming one.

One of the most important functions of the counselor in education or industrial practice, therefore, is the helping of individuals to match their aptitude and ability patterns with their interest patterns. Personnel workers are familiar with the large number of cases in which potential aptitudes never are developed because the individual has little interest in or negatively rejects behaving as his aptitudes might permit him. In education we are constantly impressed by the great numbers of students who complete, or partially complete, special training, often at a high performance level, and then make little or no use of this training after graduation. Men and women train themselves to be physicians, lawyers, and engineers, then, within a few years, find happiness in a field perhaps quite foreign to the specialty in which competence has been obtained. For example, the authors know a man who went to the master's degree in civil engineering, practiced it for ten years, and is now a distinguished surgeon; another, graduated as a dentist, is a successful distributor of motion pictures; a former physician manages a large paint company. Thousands of women train in a variety of job fields and never use their skills and knowledges. Many variables are responsible for such waste of individual time and energy, but one of the chief causes is lack of impelling interests.

Although research in the fields of interests, life goals, and motivation has been widespread, the general clinical counselor, concerned with educational-vocational problems, is

fortunate in having the major contributions regarding vocational interests concentrated in a relatively small number of sources. Omitting early research articles, the counselor can turn to Fryer[1] for a comprehensive review of major investigations in the field of interests prior to 1931. Strong[2] happily did not repeat the work of Fryer, but instead followed through from where Fryer left off to 1943. In addition to these works, several important supplementary publications have appeared Darley[3] published his Clinical Aspects and Interpretation of the Strong Vocational Interest Blank in 1941. Super[4] contributed his Avocational Interest Patterns: A Study in the Psychology of Avocations in 1940, followed by his excellent review of Strong's book in 1945. Carter's[5] monograph appeared in 1944. Berdie's[6] review of the field was published in 1945. The 1946 manual for the Kuder Preference Record[7] has given us additional valuable information regarding this widely used interest inventory.

The story of the development of judging and estimating the educational-vocational interests of men and women is too well told in the sources cited to merit treatment in this

[1] Fryer, Douglas *Measurement of Interests* New York: Henry Holt and Company, Inc., 1931.

[2] Strong, Edward K., Jr *Vocational Interests of Men and Women.* Stanford University, Calif: Stanford University Press, 1943.

[3] Darley, John G. *Clinical Aspects and Interpretation of the Strong Vocational Interest Blank.* New York. Psychological Corporation, 1941.

[4] Super, Donald E. *Avocational Interest Patterns: A Study in the Psychology of Avocations* Stanford University, Calif.: Stanford University Press, 1940.

Super, Donald E. "Strong's Vocational Interests of Men and Women," *Psychological Bulletin*, 1945, 42 359–370.

[5] Carter, Harold D *Vocational Interests and Job Orientation* Stanford University, Calif. Stanford University Press, 1944. *Applied Psychology Monographs*, No. 2.

[6] Berdie, Ralph "Range of interests," *Journal of Applied Psychology*, 1945, 29 268–281

[7] Kuder, Frederick. *Manual for the Kuder Preference Record* Chicago: Science Research Associates, 1946.

book. We can devote our attention to the nature of interests and to the tools and techniques for determining their range and intensity.

The Nature of Educational-Vocational Interests

The reader will find detailed discussions of the nature of educational-vocational interests in the sources to which we have already referred. Against this background we may project a working hypothesis on which the counselor can base his clinical judgments. First, we may note the various concepts of interests on which the psychologist has predicated his attempts to judge, estimate, and measure them.

Fryer,[8] using the rubric "Present Day Conceptions," states:

> The measurement of interests, however, is making new distinctions. During the last ten years of research, subjective interests have come to be regarded as complex configurations of feeling experience, and the driving force of the experience is no longer considered to be a part of the interest factor being measured. The motivation factor in experience is considered separately. The criterion of interest is thought of as the feeling.

Strong presents an impressive array of data supporting his measurement of interests but avoids a concise statement of their nature.[9] In summarizing Chap. I, "The Nature of Interests," he asserts that an interest is not a separate psychological entity, but merely one of several aspects of behavior. He considers both acceptances and rejections of the various items in his inventory as important, on the assumption that interest includes the things we despise as well as those we like and that we are disinterested only in things and areas which rouse no emotion of either sort This is consistent with his sound emphasis on the need for pattern interpretation of multiple scores and avoidance of interpreting single scores alone.

[8] Fryer, *op cit*, p. 463
[9] Strong, *op cit.*, p. 23.

Darley[10] supports the hypothesis that interests are by-products of the personality and its development and maturation. His long experience in using this instrument clinically with thousands of cases and his research in this field have led him to this position. He rejects the assumptions that interests arise chiefly from successful behavior which wins social approval and that interests develop by recapitulation The phenomena of lifelong consistency and the tendencies for interests to become less variable with age are cited in support of his stand.

Super[11] makes the point that "in spite of more than twenty years of fruitful study, no adequate standardized terminology has come into general use to denote these different types, levels, or degrees of interest." For purposes of this chapter on interests he standardizes terminology by referring to superficial and transient interests as *specific interests:* for broad categories of interests he uses the terms *basic* and *underlying,* the more fundamental kinds are labeled *drives;* strength or depth of interest is termed *degree of interest.* He considers *specific interests* as the triggers, or specific stimuli, which release activity to relieve tensions by giving satisfaction. Specific interests which satisfy a drive by various types of tension release are varied, while the drive itself remains relatively constant. He is in substantial agreement with Strong's position that interests result from an interaction of hereditary and environmental factors which crystallize, or become stable, with increasing age. This is not in conflict with Darley's conception of interests as a by-product of personality development.

Carter's[12] view of the nature of interests includes the various conclusions reached by selected authorities. He states that

> A number of studies by Lentz and Nickel and by Carter contain explicit suggestions that interests are properly regarded as

[10] Darley, *op cit*, pp. 56–57.

[11] Super, Donald E. *The Dynamics of Vocational Adjustment.* New York: Harper & Brothers, 1942. P. 82.

[12] Carter, *op. cit.*, pp. 9–13.

traits of personality. The series of studies from the University of California, . . . indicates that interests are not independent of intelligence, although they are primarily affective phenomena.

The lack of close relationship between interests and abilities is clearly seen, but its significance has not been fully appreciated. . . . The persistent view that interests need not be measured directly but should rightfully be inferred through studies of abilities continues to find expression in popular articles.

. . . Many such apparent contradictions indicate that a number of variables including age, specific experiences, social and economic group differences, and occupational experiences must be studied more intensively if we are to understand the influence of each upon the development of vocational interests. (P. 12.)

Gardner Murphy[13] defines interest in the singular as (1) "The attitude with which one attends to anything; the feeling accompanying attention"; and in the plural, (2) "interests are dispositions defined in terms of objects which one easily and freely attends to or which one regards as making a difference to oneself." Relating interests to canalizations and dominant conditioned responses he says:

Interests also behave like dominant conditionings. Data on the continuity of interests, which show a rather high degree of instability during the second decade of life, indicate that in the young adult this set of symbols has taken on (within the ordinary rather constant environment) almost the fixity—even the rigidity—of the fundamental language habits themselves. (Pp. 719*ff*.)

He believes this stiffening and setting of interests becomes intelligible if thought of in terms of the theory of overlearning, which makes of a habit or attitude overlearned a thing highly resistant to the effects of disuse and rustiness. He goes on: "Interests—in work, in hobbies, in games, in books—are overlearned responses in this sense, and they stick, consequently they play a huge role in personality consolidation."

[13] Murphy, Gardner *Personality.* New York: Harper & Brothers, 1947. P. 989.

The approach of Kuder has differed from that of Strong in certain respects. Simply stated, Strong's understanding of the nature of interests grew from the building and use of his instrument with carefully identified occupational groups at the professional levels. Factors being measured were determined experimentally after these selected groups were measured and the results pooled to yield desired points of reference. The use of factor analysis and other correlational procedures resulted in broad areas, or families, of occupations based upon occupational norms Kuder,[14] by a logical inspectional method, derived paired preference items which were statistically related and grouped them into nine broad, arbitrarily named, occupational areas. His original norm group was 500 Ohio State University students in the years 1934 and 1935. The application of his method to occupational groups of adults came at a later date He does not formulate a clear statement of the nature of interests or preferences.

A summary of the findings of various investigators as interpreted by the present authors is as follows.

1 Interests are an aspect of personality development shaped by both hereditary and environmental factors.

2. Long-range, stable, occupational interests emerge during the early teens, but mature interest patterns are not fixed for most individuals until an age of approximately twenty-five years.

3. Interests are not necessarily closely related to aptitudes or abilities.

4. Interests probably cannot be created *de novo* and in a short time merely by the classroom presentation of varied and vicarious experiences to youth. Such exposures may possibly, however, start the development of a new zone of interest, help to fix existing interests, or uncover latent ones.

5. A strong motivation toward certain types of occupational or avocational behavior is expressed by a wide number of responses to an extremely wide range of stimuli.

[14] Kuder, *op. cit*, pp. 26–27.

6. Interests, as aspects of personality and as employed by the general clinical counselor, involve both acceptance and rejection of possible lines of activity. For example, the typical worker with processes and things (mechanical interests) obtains interest scores which are negatively related to scores which measure a liking for persons and social situations

7. The estimated, judged, or measured interests of secondary school and college students in an occupation seem to them to be and in fact often are quite unrelated to the training program they must take to prepare them for employment in the occupational family in which they have an identified dominant interest.

8. A legitimate interest in an occupational outlet often has little effect on grades earned in the curriculum leading to that outlet. Much of the training program in a medical school may be largely quite unrelated to the particular aspects of medical practice toward which the interest is expressed.

9. Vocational and avocational interests appear to run in similar directions for a large proportion of individuals.

10 The interests of invididuals tend to become less varied with increasing age.

Judging, Estimating, and Measuring Interests

One of the counselor's most difficult tasks is to help the counselee arrive at a valid and reliable estimate of his vocational interest pattern and to help him see and assess this pattern superimposed upon, and integrated with, the aptitude and ability profile. There is no one simple, reliable method of arriving at the occupational families in which a given individual will be reasonably happy and successful in making optimal use of his aptitudes and abilities. Counselors have been searching for a workable solution to these problems for decades, and man for centuries. Several difficulties must be overcome before the counselor and counselee can arrive at a common ground of understanding which

will permit intelligible communication concerning these complex dynamic patterns and their bearing upon the choice of and achievement in courses of study and training and the further selection of, and success in, an occupation

A first major difficulty is that of the common tendency to think of specific job labels when one speaks of interests. Usual statements of laymen are phrased in terms of interest in sales work, medicine, engineering, office management, toolmaking, railroad engineering, or school teaching. Such statements tend to be at once too specific and too vague—specific as to, say, teaching but vague as to school level, subject to be taught, etc. The field-level approach is both more logical and psychological Counselors must either initiate the counselee into thinking in these frameworks by a one-to-one seminar in matching talents and occupational information or use the specific statement of the counselee ("I want to be an engineer") to introduce the field-level concepts in a less direct manner. Group orientation programs which prepare the way to thinking in these terms can be great time savers for the counselor.

A second difficulty, related to the first, is the counselee's unfamiliarity with patterns of acceptance and rejection. He cannot be expected to know that certain claimed interests are mutually exclusive of others claimed at the same time, if we accept interests as indicators of personality structure and of potential school and work success. For example, it is not at all unusual to have a boy claim technical interests at the same time that he describes enjoyable experiences related to business contact and social welfare. He may even express a strong dislike for mathematics, essential to technical achievement, and tell of his dismal experiences with this field of knowledge in the classroom

A third difficulty is the counselee's lack of knowledge of himself as an individual compared to successful workers in various occupational groups. The log-cabin or office-boy-to-president tradition is strong in the United States. A belief that "anyone can do anything he really wants to, if he

only tries hard enough" is widespread. The issue is confused further by the notion that in a "free" America "anyone who wants to can get or make a chance to try anything." In the face of these firmly held cultural myths, the counselor meets many kinds of resistance. His right to tell a counselee what he can, must, or should do is legitimately questioned, sometimes with great heat. He must walk a verbal and emotional tightrope in his explanations of kinds and levels of interests and abilities and of how these operate to restrict and confine the overweening ambitions of all of us, even when we are citizens in a democracy and presumably committed to loosely defined "free" enterprise. The reader is referred on this point to the discussion of the idealized image in Chap. 2.

A fourth difficulty grows out of the first three. Counselees hear what they want to hear. The experienced counselor gradually becomes hardened to the constant stream of scuttlebutt reports of what he is supposed to have told his counselees. If the counselor has tentatively discussed technical occupations and used a number of specific occupational outlets as possible examples, the counselee is quite likely to report that the counselor has told him he has the interests and abilities of a laboratory technician, engineer, or surveyor. If, however, one of these appeals to him more than the others, only that one is remembered and reported. Many counselors attempt to counter this human tendency by recapitulating and summarizing on paper what they said in the interview and giving the counselee a carbon copy to take with him!

Despite these and other difficulties, competent counselors annually help thousands of people to reach an understanding of their vocational interests and the relationship of these to their abilities and of both to schooling and employment. Because the counselee usually does not have the information to arrive at sound estimates of his interests, the counselor must act as a trail marker to help him. Counselors have three general approaches to diagnosing occupational in-

terests: observation, claims of the counselee, and measurement. We shall consider these briefly in the closing pages of this chapter.

The Role of Observation in Diagnosing Occupational Interests

Observation is of two orders, direct and indirect. *Direct observation* is seldom a tool readily available to the counselor. He has too heavy a case load, with his too many counselees doing too many things at the same time, to make this a practicable method. Even when the opportunity for direct observation presents itself, as it occasionally does, interpretation of what is observed is difficult. Most small boys tend to be interested in mechanical operations and objects This may be a cultural or an individual development If we can observe in one person a consistent pattern of liking for scientific and mechanical pursuits over a long period of time, plus his effective dealing with increasingly complex materials and concepts, certain judgments can be made This is particularly true if the counselor has had enough opportunities for observation of many other boys in this age group to permit him to establish fairly reliable, though subjective, norms When we deal with girls our problems are increased because of our quite rigid cultural mores. Girls receive a different type of home training, often utilitarian in nature because of the probability of homemaking as a socially desirable and personally satisfying vocational terminal There is little conclusive evidence that direct observation aids greatly in the process of helping individuals to find their interests at an early age, despite the conclusion jumping of many parents that because a youngster plays with a steam shovel or construction toys he will grow up to be an engineer or because he cuts up frogs at age six he will be a surgeon at thirty.

What of direct observation and the working adolescent or young adult? Here, too, we are faced with difficulties in interpretation. Adolescents and young adults are usually engaged in threshold jobs at the semiskilled, unskilled, or low

personal service or distributive levels. Even when they express interest in what they are doing, one must draw off his assumptions carefully because the interest expressed may actually lie in something other than the constellation of duties performed. Examples of these corollary stimuli, frequently mistaken for job interests, are the satisfaction of making and spending one's own money, freedom from home apron strings, the feeling of being grown up and responsible, or joy in being on the way to the achievement of goals to which the present job is recognized and tolerated only as a first step but not as a desirable end in itself.

Indirect observation results in information collected from the counselee, his parents, siblings, friends, and teachers regarding his attitudes toward occupational activities. The autobiography and occupational history have often proved sound methods of obtaining indirect observations. The anecdotal record accumulated over a period of years is also a fruitful method. In some educational institutions, teachers' interpretive remarks used in reporting student progress are useful in determining likes and dislikes of an individual. Parents can help by giving a developmental description of hobby activities over a period of time. Again, however, we must proceed with caution An academically bright boy or girl who has sound study habits will tend to get top grades in any subject-matter area offered in the secondary schools or colleges The influence of hero worship, of an admired friend, or a particularly well-liked group of associates may lead such an individual into temporary interests and activities which are dropped when the stimulation which roused them disappears. If we properly analyze the motivations which have led to behavior indirectly observed, it is possible to obtain information helpful in estimating interest patterns.

Claims of the Counselee

The literature in this field is filled with references to individual claims of interests in vocations. In the past many workers totted up the totals of the occupational labels se-

lected as of major interest by school and nonschool populations, and they and their readers drew many false conclusions from these figures. More recently, much more sophisticated and rigorous studies have been made with refined statistical and analytical techniques. Darley[15] gives a good example of this type of study. His general conclusions tend to be in agreement that claimed interests are invariably too unreliable and invalid to be accepted at face value without checking by more objective measures. This appears true whether the claims are in terms of occupational labels or of field and level concepts. Strong[16] reviews many of the findings concerning *claimed* as contrasted with *measured* occupational interests.

The counselor must, therefore, be extremely careful in accepting counselee claims of interest as valid If, as some institutions and some counselors do, we insist that students must make career choices in order that they may be assigned to a curriculum, they will make them. But almost without exception the choice will be one which carries social prestige and without regard to measured interests or abilities. If we do not apply such pressure, fewer counselees will choose either by fields or labels. And, if we let it be known that "no choice" is a sound judgment for many counselees, especially in the younger age groups, we shall tend to get a greater number of "no choice" responses Totally to disregard counselee choices is poor counseling practice To accept such choices blindly is equally faulty. Critical evaluation of counselee choices, in the light of direct and indirect observation and measurement, is the only sound approach

The Measurement of Interests

The matter of measured interests has been given more attention from the experimental standpoint than have the other methods of judging and estimating interests The

[15] Darley, *op cit.*, pp. 21–25
[16] Strong, *op cit.*, pp. 28*ff*

astonishing amount of research done upon the Strong Vocational Interest Blank, particularly by its author, who has devoted his own professional lifetime and has directed the thought and energy of many of his graduate students to the instrument, makes it almost unique in the field of measurement. To a lesser extent Kuder has given a parallel single-minded attention to his Preference Record. With such concentrated attention by competent psychologists with a direct interest in specific instruments, and with the heavy contributions of other researchers, we have unusually good and sophisticated tools for measuring interests

The reader is urged to review Carter's[17] summary of interest measurement to 1943. Among his conclusions are the belief that interests are being best studied as aspects of personality; that they are developmental in nature and that a developmental approach is necessary for their full understanding; that the measurement of vocational interests is about as reliable as the measurement of academic intelligence by group tests; that interest tests possess greater validity than is generally credited to them; and that measured vocational interests are pertinent to vocational choices.

Many experienced clinical counselors feel that interest inventories are among the most difficult measuring instruments for the beginner to interpret Not only are the better inventories the result of complicated statistical concepts and devices but also, because of their affinity to other types of personality measurement, they present problems of interpretation beyond the reach of the average counselor A fuller appreciation of their complexity can be gained by reading Strong's *Vocational Interests of Men and Women.* Even the soundly trained and long-experienced counselor finds that he must continually exercise caution in interpreting interest measurements

With the many interest inventories now available to counselors the following precautions should be observed in selecting and employing interest inventories:

[17] Carter, *op. cit.*, pp. 68–69

1. Interest inventories should be chosen with regard to the age and sex of the group or individual with which the instrument is to be used. The Strong Vocational Interest Blank is an excellent instrument when the results are obtained from adults or young adults. It is not appropriate for investigating interests of youth much below the age of seventeen.

2 Interest inventories should be selected to serve best the purposes of the counselor A group program can well utilize the Kuder Preference Record as a stimulus to thinking about interests and ultimate vocational choices. This instrument is useful at ages well below those for which the Strong blank is intended

3 Interest inventories should usually be selected in terms of the validity and reliability of the scales included in the instrument and the norms upon which it is based. In some instances a promising instrument is useful only when new norms are established on a local population,[18] for a special purpose. If the purpose is to help to select occupational outlets for counselees, the norms, or points of reference, should be appropriate to the age and ability level of the counselee and the jobs available in the area of his probable employment. If occupational norms are supplied by the test makers it is wise to use the criteria recommended by Fryer[19] and Strong[20] that the minimum number of cases for standardizing an occupational key be 250 and the optimal number be 500. Since, further, mere numbers do not guarantee that sampling has been adequate, attention should be given to the method of sampling used. If the norms are based upon samples of students in secondary schools or colleges, the question of sample purity must be raised A num-

[18] Young, C. W, and Estabrooks, G. H *Young-Estabrooks Scale for Measuring Studiousness by Means of the Strong Vocational Interest Blank for Men* Stanford University, Calif. Stanford University Press, 1936

[19] Fryer, *op cit*, p. 91.

[20] Strong, *op. cit*, p. 131.

ber of examples will illuminate this principle. A sample of 1,000 college freshmen is likely to include a number of individuals who have chosen curriculums in which there is no joy for them and who may, therefore, skew the results Freshman engineers in a university almost always include in their number many who do not have the measured interests of engineers and who will, therefore, be unhappy, unsuccessful, or both in that course of study and whose responses to the interest inventory will reflect their misery and distort the norms. The problem is more acute when secondary school norms are used, based, for instance, upon students in high school commercial studies, since the group will include many who do not belong in this kind of training. It is, therefore, a particularly dangerous practice to use the results from interest inventories based on secondary school norms to predict occupational happiness in the jobs which follow completion of training. On the contrary, unless the norms are built upon scores from which are eliminated all but those of former students who have been employed and have found themselves happy and satisfied with their occupational duties, we have little justification for placing dependence on the results of the test for purposes of helping our present counselees to make occupational choices which are supposed to be stable and lasting

4. Interest inventories should be selected which have valid points of reference, another aspect of the norm problem. It has been shown by Strong that when we compare specific professional occupational scores on his blank with a norm composed of professional workers, such as doctors, architects, etc, these professional workers show significantly separated interest patterns. If, however, we use these professional norms in the attempt to separate or differentiate the interest patterns of semiprofessional or skilled workers, the differences do not stand out Or, if this procedure is reversed and the scores of semiprofessional or skilled workers are taken as a point of reference, these will separate people in these occupations from each other in terms of their meas-

ured interest patterns, but this new point of reference will make the professional occupations more or less indistinguishable.

5. Interest inventories should be selected to yield stable occupational interest *patterns.* Strong[21] and Thurstone[22] have analyzed the Strong Vocational Interest Blank results by factor analysis and related statistical techniques They found that four to five factors accounted for the major aspects of interests being measured. Darley[23] adapts the findings of Strong and gives the following interest types obtained from the Strong Vocational Interest Blank for Men. He also reports an unpublished factor analysis of the women's blank done under his supervision. The categories found are labeled as follows:

Men	*Women*
1. Technical	1. Technical
2 Verbal or linguistic	2 Verbal or linguistic
3 Business contact	3 Business contact
4. (*A*) Welfare or uplift	4 Welfare or uplift
4 (*B*) Welfare or uplift	5 Nonprofessional interests
5 Business detail	
6 Certified public accountant	

Kuder, as has been indicated, arrived at his areas by a different method. Despite several studies regarding the comparability of the two inventories, it has not yet been shown that they are measuring the same aspects of personality under headings which seem to be comparable.

SYNTHESIS

There is no single method by which one can estimate, judge, or measure human occupational interest with certainty. The counselor who is willing to accept observation, counselee's stated choice, or the results of a single interest

[21] Strong, *op cit*, p 140*ff*.

[22] Thurstone, L. L "A multiple factor study of vocational interests," *Personnel Journal*, 1931, 10·198–205.

[23] Darley, *op cit.*, pp 12–13.

inventory alone is rash indeed. The best results appear to be obtained when an experienced counselor uses subjective clinical weightings for all sources of data and arrives at conclusions with the counselee which are consonant with most of the variables which complicate counselee choices. Attitudes toward occupational experiences and hobbies, persistent behavior logically related to occupational outlets, direct and indirect observation, and the results from interest inventories, all contribute to varying extents from counselee to counselee. If pressure of time forces us to use a single method, most counselors prefer to depend upon a well-standardized measurement because of its greater demonstrated reliability and validity. Few counselors, however, can so depend with an easy conscience and hence are careful to qualify and hedge their recommendations and declare them tentative.

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Chapter 9. COLLECTION OF DATA FOR A SYSTEMATIC CASE STUDY

In Chap. 5 we considered the *systematic case study* as the major synthesizing tool with which the counselor focused all of the other clinical tools and techniques on the analysis of the problems of his counselee and on the diagnosis of his abilities, interests, and other personality traits. Because of the importance to the counselor-in-training of a clear understanding of the case study for general clinical counseling, this chapter and the one which follows are devoted to the methodology of assembling pertinent case data and applying these data clinically in the counseling situation. Before turning to the major objective of this chapter, a short review of general considerations surrounding the systematic case study *in dealing with educational-vocational problems* is in order.

To some readers who are planning a professional career in general clinical counseling, the materials which follow will appear to involve enormous amounts of time for analysis, synthesis, diagnosis, and prediction. In fact for the beginner it always does so. But his reward comes finally, after patient and sometimes tedious, confusing, and frustrating work, in a sudden clarity of insight, a falling into place of the fragments of a total and satisfying picture. This Williamson has referred to in his writings and his speeches as the "click" phenomenon. His point is one familiar to most professional counselors. With experience, the counselor discovers that what seem, at first, a bewildering confusion of apparently unrelated details sort themselves eventually into meaningful clinical patterns. The

first case one counsels is a disturbing experience The counselor in this situation who does not wonder what he can contribute and who should be counseling whom is indeed unique However, after a large number of cases, perhaps twenty-five or perhaps a hundred or more, have been counseled, there will come a time when the data for a certain case will on first full reading form a clear, meaningful pattern even with complex problems involving complicated data. The counselor's reaction will be a healthy one of feeling that "It just can't be" and "How did that happen? Can I do it again?" When this occurs he usually undertakes a painstaking reconsideration of all the variables involved and finds that they yield the same answers. After this point has been reached, and it will vary from counselor to counselor, the search for clinical meanings of familiar types of information will no longer be the time-devouring struggle for understanding it once was. A legitimate and relatively high rate of speed in diagnosis will be attained. It should be noted, however, that for most counselors this much-to-be-desired competence is not possible without their undergoing supervised experience over a period of time in which counseling is a constant day-by-day, week-by-week experience. It is seldom attained by the casual, part-time amateur counselor in training.

A danger lies in this "click" phenomenon. This is the hazard of becoming arrogant, of feeling that answers will always be this easily found, and this leads to the error of considering similar data to have comparable meanings from case to case and ignoring the fact that individuals and situations can never be identical This is one of the reasons why a reasonably limited counselor load is important When overloads occur we tend to look for short cuts and to make stereotyped interpretations of clinical data as a tempting, and often unrecognized, method of attaining speed, of getting our work done, of relieving the pressure of a backlog of cases clamoring for help. The number of counseling interviews in a day or school term is not to be

considered in the same light as the number of units a piece-worker turns out on an assembly line or like mass-production dentistry which demands so many fillings per day regardless of size or difficulty. Instead it is comparable to the doctor's job, one patient needing a single aspirin, another a major operation and months of care The authors have known many counselors who recognize in themselves and fight against this tendency to fall into stereotypes at various stages of their progress toward competence This common experience may indicate that there are plateaus of learning from which one might trace professional growth. In any case, a misinterpreted case history is no help to a mishandled counselee, and the danger of mistaking stereotyped conclusions for true "clicks" must be carefully avoided

In Chap 1 the point was made that there is no substitute for an internship under sound supervision. While a large number of our best counselors in the past arrived at professional status by a trial and error method, most of them admit to being uncomfortable at the memory of some of the inevitable bungling which occurred. True, even a decade ago, there were too few clinics for interns in general clinical counseling. There should be no need now, or in the future, however, for the trainee to miss the opportunity, since major universities are increasingly arranging for internships in their own counseling systems and cooperating with high school, junior college, and industrial and business personnel officers to provide them In summary, the trainee can benefit by the supervision and direction of experienced persons. He can sharpen his tools in staff conferences on his own and others cases, and he can become a better diagnostician by case reading techniques followed by discussions with other trainees and clinicians. Assuming that the reader has a working knowledge of counseling tools and techniques and that his experience has prepared him for handling student problems, let us now set the stage for working through a composite, hypothetical case

THE SETTING

Joseph R. Williams is a second-semester freshman in Y University. The university is a fairly large one, with 12,000 regularly enrolled students. Its largest undergraduate college is Liberal Arts, which is charged with the responsibilities of providing general education in its lower division and specialized majors in many scholastic fields for its upper division. The university has a graduate school and provides professional outlets in education, medicine, law, the physical sciences, psychology, sociology, and numerous other specialties growing out of departmental offerings.

The university has a reasonably well-coordinated formal student personnel program, which includes a student counseling center. This counseling center is staffed by clinical psychologists holding Ph.D. and Ed.D. degrees or their equivalent. Predoctoral interns who hold masters' degrees aid in many of the working operations of the counseling program. The psychometric division orders, administers, and analyzes tests and collects data both from individual testing and from the various group testing programs, including those required of all entering students.

The personnel records for each student are gathered in a single folder, which is filed in the counseling center. When a student comes for help much advance material is instantly available there. This building of a folder for each student, therefore, provides the basis for rapid and comprehensive service to the individual student counselee.

The physical plant has a usable floor area of 4,000 square feet. Included in this plant are a reception room, a group test room with capacity for 50 students, three rooms for individual test administration, private offices for each counselor, shared offices on staggered schedules for interns, an observation office with one-way glass and intercommunication system to a conference-seminar room, a case history file room, a scoring room with three scoring machines and

test storage facilities, and the usual clerical and other personnel and equipment necessary for an operation of this size Without introducing further details we can now turn to Joseph R. Williams, counselee.

THE COUNSELING PROCESS—COLLECTION OF DATA

The receptionist looks up and smiles at Williams as he stands before her desk. He is dressed much like other students, and there seems to be little to distinguish him from the others who come to the center. He asks for an appointment with a counselor. He is given a brief identification form to fill out and, when he brings it back to the desk, he is asked whether he would prefer to wait and see a counselor for a preliminary interview in a few minutes with anyone available or to come back in a day or two for an appointment with the counselor who will work with him. Williams says that a friend of his got a lot of help from counselor Jones and that he too would like to work with Jones. He is told that Mr. Jones' calendar is full at present but that an appointment can be made for three days later. Williams still feels that he would rather have Jones for a counselor than anyone else, so the appointment is made.

THE MACHINERY

Almost at once after Williams has left the center, the preparations for his first interview with counselor Jones are begun. His folder is drawn from the files and referred for checking to a graduate intern, Smith, who assists Jones. The intern finds that the high school record has been received from the admissions office. Grades for the first semester have come from the registrar's office. The clearance slip from the student health service is in its place. An educational-vocational autobiography from the first-semester English course has been checked out to Williams' academic adviser and must be recalled. No group activity slips are on file from the student activities program. The

extensive general information blank required from all entering students is in place. The records show that he has had no interviews with a university counselor. The faculty academic adviser apparently has not as yet put any notes on selection of a course of study in the folder. Williams has no notation of disciplinary action against him, but this item will be checked with the secretary of the discipline committee to make sure The intern phones this secretary and goes to the academic adviser to get the autobiography and any notes he may have about Williams. He sees to it that the folder is on counselor Jones's desk a day in advance of the first interview. Let us now inspect the specific information which counselor Jones will have at his disposal when Williams comes in.

Data from Educational Experiences

Williams has proceeded on a routine academic schedule since the beginning of the primary grades. He entered first grade shortly after his sixth birthday, took no skip promotions, continued to advance through elementary grades, junior and senior school in regular progression. No grades from the elementary school are in the folder. The junior and senior high school grades yield the following summary.

Area of study	*Letter grade*	*Junior high school*	*Senior high school*
Arithmetic	B	x	
Algebra	B	x	
Geometry	B		x
English	A	x	
	B		x
Social studies	A	x	x
Physical sciences			
General science	B	x	
Chemistry	C		x
Physics	C		x
Languages			
Spanish	A		x
Shop	C	x	x
Typing	B		x

Williams graduated from high school twenty-first in a class of 210. He was the eighth highest boy out of the 113 male students in this class. He had been awarded no honors for his academic work but had achieved a substantial scholastic record.

The grades for the first semester of the freshman year in the college of liberal arts were.

Basic English	B
Spanish	B
Political science	C+
Chemistry	C−
Physical education	C
Mathematics	C−

Data from Standardized Tests

Williams had come from a school system where a minimal test program was followed The high school record carried the following notations.

Stanford Binet*	Grade 1	113 I.Q
Otis Intermediate†	Grade 8	119 I Q.
Otis Higher Form A	Grade 10	110 I Q
Ohio Psychological‡	Grade 12	60 percentile (college freshman norms)

The test record from the battery given to entering freshmen at Y University yielded the following data.

* Terman, L M , and Merrill, M A. *Measuring Intelligence* Cambridge, Mass The Riverside Press, 1937

† *Otis Self-administering Tests of Mental Ability, Manual of Directions and Key* (For Intermediate and Higher Examinations) Yonkers, N Y World Book Company, 1928

‡ *Ohio State University Psychological Test.* Columbus, Ohio Ohio College Association, 1941 Science Research Associates, Chicago, distributors.

		Percentile for freshmen	
		National	Local
American Council on Education (Form 1948)*	Quantitative	37	22
	Linguistic	72	56
Cooperative General Science (Form 0)†	Total	45	32
Cooperative English (Form Pm)	Total	75	61
Cooperative Intermediate Algebra (Form T)	Total	29	14
Cooperative Test of Social Studies Abilities (Form Q)	Total	83	74
Minnesota Clerical Test (Short Form)‡ (Norms for Employed Clerical Workers)	Names	50	
	Numbers	33	
The Strong Vocational Interest Blank (for Men) (see p 289)§			

* *American Council on Education Psychological Exam for College Freshmen* Washington, D C : American Council on Education, 1947.

† *Cooperative Achievement Tests* New York Cooperative Test Service, 1949.

‡ *Minnesota Clerical Test* New York: The Psychological Corporation, 1946

§ *Strong Vocational Interest Blank (for Men)* Stanford University, Calif : Stanford University Press.

Williams, Joseph R

SUPPLEMENTARY INFORMATION BLANK B

Underline all the individual activities in which you have engaged with some degree of success *Cross out* any activities you have tried and found you disliked or were not interested in *Encircle* those activities you enjoy very much. Add other activities in any group if you wish

a. Literary Activities

1. ~~writing plays~~
2. writing poems
3. (writing stories)
4.
5.

b. Dramatic Activities

1. giving dramatic readings
2. radio speaking
3.
4.

c. Creative Art Activities

1. drawing
2. interior decorating
3. modeling
4. painting
5.
6.

d Musical Activities

1. composing music
2. ~~playing a musical instrument~~
3.
4.
5.

e. Household Activities

1. cooking
2. home care of the sick
3. housework
4. taking care of children
5.
6.

f. Handicraft

1. crocheting
2. sewing
3. dressmaking
4. ~~metal work~~
5. leather work
6. woodcarving
7. ~~working with tools~~
8. ~~working with machinery~~
9.
10.
11.

g. Individual Sports

1. archery
2. bicycle riding
3. boating
4. golf
5. (hiking)
6. horseback riding
7. ice skating
8. roller skating
9. skiing
10. (swimming)
11.
12.

Underline those of the following that you thoroughly enjoy. *Cross out* those that you distinctly dislike. *Add* any others in each group and mark in the same manner.

a. *Listening to Music* (radio, concerts, etc.)

1. concert music
2. dance band
3. ~~opera~~
4. popular music
5. symphonies
6.
7.

b. *Watching Sports*

1. baseball
2. basketball
3. football
4. ~~golf tournaments~~
5. hockey
6. polo
7. tennis
8.

c. *Attending Amusements*

1. amusement parks
2. movies
3. plays
4. races
5.
6.

d. *Attending Lectures on*

1. ~~book reviews~~
2. current events
3. political issues
4. travel
5.
6.

e. *Reading* (aside from books)

1. digests
2. ~~fashion magazines~~
3. ~~movie magazines~~
4. mystery story magazines
5. newspapers
6. news weeklies
7. ~~popular fiction magazines~~
8. travel and adventure magazines
9. ~~women's interest magazines~~

f. *Listening to Radio*

1. comedians
2. ~~continued stories~~
3. educational information
4. forums
5. mystery stories
6. news comment
7. ~~plays~~
8. ~~quiz programs~~
9.
10.

The reading you have enjoyed particularly during the past year included:

Magazines (names)	*Books (types)*	*Favorite Authors*	*Special Topics*
Reader's Digest	Mystery	Rhinehart	Sports
Collier's	Biography	Van Dyne	World events
Fortune	Adventure	Allen Drinkwater	Business events

List group activities in which you have participated, such as paper, musical activities, school clubs, group sports, creative arts groups, religious activities, debate, dramatics Underscore any in which you have acted as a leader, served as committee chairman, or club officer.

School paper (H.S.), substitute on high school football team (2 yrs.), graduation committee (H.S.), Spanish club vice-president (H.S.)

List hobbies you have had:

For a short period	*One year or more*	*Five years or more*
		Reading
Collecting stamps		Watching athletic contests

Underline any of the following words which characterize you: nervous, sleepless, easily exhausted, headache, fainting spells, fits or convulsions, dizziness, backache, tingling in hands or feet, stammering or other speech difficulty, frequent periods of gloom or depression, poor health.

Underline any of the following words which you feel describe your general make-up. persevering, friendly, patient, stubborn, capable, tolerant, calm, imperious, pessimistic, reserved, bashful, self-confident, jealous, talented, quick-tempered, anxious, depressed, nervous, easily exhausted, unhappy.

It is possible to make a rough classification of occupations in terms of your general interests and abilities In the following list, indicate in order of preference (1,2,3) the three groups in which you believe you would best fit:

____ Occupations involving business contacts with people, such as the various fields of selling, promotional work, politics, etc.

3 Occupations involving business detail work, such as accountancy, business statistician, cashier, banker, stenographer, and office clerical work.

____ Occupations involving social service activities, such as YMCA worker, teacher, Boy Scout executive, personnel worker, social case worker, welfare worker, etc.

____ Occupations requiring special artistic abilities, such as musician, actor, artist, interior decorator, designer, etc

2 Occupations involving executive responsibilities, such as director, office manager, foreman, etc.

1 Occupations involving technical or scientific work, such as engineer, toolmaker, etc.

____ Occupations involving verbal or linguistic work, such as lawyer, newspaperman, author, advertising man, professor, librarian.

List in chronological order all your work or employment experiences to date. Include part-time or summer jobs.

Cutting lawns, running errands, etc.

Morning paper route

Part-time clerk, grocery store

Xmas work, U.S Post Office, Camp counselor, boys camp

Which of these jobs did you like best?

None of these meant much

Why? ____________________

List in order of preference five occupations in which you would like to earn your living Do not consider your abilities or job opportunities in making this list. Just consider whether or not you would be happy in the work.

	Occupation	*Reasons for Interest in the Occupations*
1.	Medicine	Help people, security
2.	Engineering	Security, good oppor-
3.		tunities
4.		
5.		

What is your present vocational choice? Have none yet

When did you make this choice? (give the year)______

Why did you make this choice? Family suggestion or tradition____

Friend's or teachers' advice____. Is it the vocation of someone you admire or respect?____. Is it the choice you have made on your own responsibility?____. Other reasons:______

How certain are you that the occupation you have written above is the one you really want to prepare for: Very certain and satisfied____ Uncertain____ Very questionable X.

If you were free of all restrictions (if you could do as you wish) what would you want to be doing 10 or 15 years from now? Be a successful physician

What do you expect to earn the first year in this occupation? $5,000

At your peak? $10,000 - $30,000

How much information have you about the requirements of the vocation you are choosing? None____ Some X Extensive____

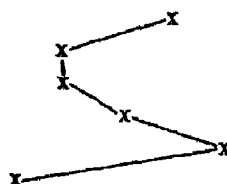
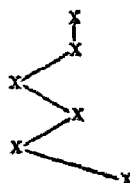
Where did you get your information? Listening to my relatives and fellow students

Have you any physical limitations (size, strength, health, eyesight, etc.) that affect or limit your choice of an occupation? No

What immediate decision must you make as to your vocational plans?

None - I'd like to get started on something

The Strong Vocational Interest Blank

Occupational scale	C	C+	B−	B	B+	A
Technical Group						
Chemist				x		
Engineer		x				
Mathematician		x				
Architect			x			
Physician					x	
Psychologist	x					
Welfare or Uplift						
Personnel Manager			x			
City School Superintendent			x			
Y.M C A Gen Sec.		x				
Y.M C.A. Physical Dir.			x			
Minister		x				
Teacher				x		
Business Contact						
Life Ins Salesman				x		
Real Estate Salesman			x			
Verbal-Linguistic						
Lawyer					x	
Editor					x	
Advertising Agency Man			x			
Business Detail						
Accountant			x			
Office Clerk		x				
Purchasing Agent			x			
Certified Public Accountant	x					

(Column heading: *Letter grade*)

	Standard score
Masculinity-Femininity	55
Interest Maturity	60
Occupational Level	70

Vocational Experiences

The vocational experiences in the general information blank give the following:

Age 10–17	Cutting lawns, running errands, etc
Age 13–15	Morning paper route
Age 16–18	Part-time clerk in grocery store
Age 18	Christmas season work, Post Office
Age 17	Camp counselor, boys' summer camp

Medical History

The student health service classifies general health as good The personal history form notes measles, mumps, a broken wrist at age fourteen, and chicken pox. There is no record of any severe emotional disturbance

Data about the Family

The family consists of the father, mother, one brother, and one sister. The parents and the sister live at home.

Father Age 46 High school education Owns and operates a clothing store in a town of 10,000 inhabitants Belongs to Kiwanis club, Masonic Lodge, and is active in the church. Hobbies are hunting and fishing.

Mother: Age 44. High school education plus two years of teachers' college. Taught school for three years No other vocational experience. Active in church work Hobby is gardening.

Brother: Age 24. High school education completed after the war. Partial disability from a service injury. Married, one daughter. Works in the radio maintenance and repair shop for a large department store in a city several hundred miles from the father's home.

Sister Age 15 Now in tenth grade

The family owns its home Williams works part time.

Observational Data

Direct. None are available because the high school records contain none and there have been none entered on the record in the university

Indirect None are available for his college semester However, the rating scale completed by the high school gives this information.

High School Personal Rating Scales

Cooperativeness

(Does he work well with others?)

Often conspicuous for poor teamwork	____	Works very well with others in group activities	____
Not a good teamworker	____	Works harmoniously with others, leads and follows well	____
Gets along with others satisfactorily in group activities	x	No opportunity to observe	____

Dependability

(Can he be relied upon?)

Steadfastly honest, truthful and reliable at all times	____	Well intentioned but somewhat unreliable	____
Can be relied upon with confidence	x	Cannot be depended upon	____
Minor lapses, infrequently, from complete reliability	____	No opportunity to observe	____

Ambition

(Drive for self-improvement)

Engrossed in realizing well-formulated objectives	____	Aims to "just get by"	____
Directs energies effectively toward usually sound growth objectives	____	No well derived goals, little drive	____
Has vague objectives· spasmodic drive toward goals	____	No opportunity to observe	x

Personal Impression

(How are people affected by his appearance and behavior?)

Avoided by others	____	Markedly liked and sought after by others	____
Tolerated by others	____	Outstandingly respected and popular	____
Liked and sought by others	x	No opportunity to observe	____

Initiative

(Goes under own steam, does not need prodding)

Self-driving; no urging or prodding	____	Needs consistent prodding	____
Much drive and initiative; requires some direction	____	Little initiative even when given much help	____
Completes assignments reasonably well without great urging or direction	x	No opportunity to observe	____

Leadership

(Helps others to work for common goals and is accepted in this role)

Never exhibits leadership	____	Sometimes leads in important affairs	____
Usually lets others take the lead	____	Displays marked qualities of leadership	____
Sometimes leads in minor affairs	x		

Personal Documents

At Y University each entering freshman is required to write an educational-vocational autobiography following a prepared outline. This autobiography is assigned as an exercise in the English department* during the first month of the semester and when corrected as such is forwarded to the counseling center.

Educational-Vocational Autobiography[1]

English I
Joseph R. Williams

At the present time I have no specific vocational choice. Like most people, I have wanted to be many things since I was a small child. When I was five or six I wanted to be a policeman. Then a flyer. My dad runs a store, so for a while I was interested in storekeeping. After helping him part-time for a number of years there seemed to be too many things I didn't

* Any unnatural word usage or stiffness in style may, perhaps, be attributed to this influence

[1] Hahn, Milton E., and Brayfield, Arthur H. *Job Exploration Workbook*. Chicago. Science Research Associates, 1945. Pp. 6–8.

like about that work. My high school teachers and the guidance director were worried because I couldn't make any choice before I graduated. Perhaps coming to college is a choice? I registered for an academic program this Fall because I was told by my college adviser that it would give me plenty of time to investigate and think about what I might want to do. At this time I am in the same situation regarding a vocational choice that I was when I finished high school.

I am not sure of the reasons for not having a choice. None of the jobs at which I have earned money have been the kinds of things I would like to do all of my life. I know that I must have some abilities which will be useful in earning a living later on. Just what my strongest points are I do not know for certain. My interests just won't center. There are so many things one can be interested in. I have thought some of chemistry but I can't seem to get too heated up about it. Mother would like me to study medicine. I don't know enough about myself to be sure I'd be happy as a doctor. I am as interested in this perhaps more than in any other training. Some of my friends like engineering, so I might try that although, because I didn't plan my course of study that way, I will need an extra semester if I decide that is what I want to do. Engineers and doctors are very well paid. Doctors are never out of a job even in a depression. Some magazines I have read say this is the "Century of the Engineer." It should be a pretty good insurance if we have depressions. But then it may be that I'd not like either after I finished college.

A doctor must be smart to get through school. He must be interested in people and their troubles. They are respected in their home towns. Their incomes let them have nice homes and good cars. They are their own bosses even though they must go out at night when people need them. Physicians are trained in science before they get into medical school. Most of the medical school subjects are scientific, including chemistry, anatomy, and other similar studies. It takes longer to be a doctor than to study for any other profession. After a college degree one must spend four years in medical school and from one to two years as an intern.

An engineer is pretty much a mathematician. His training

begins in the freshman year and is different from that that most others get. If a student wants to be an engineer and doesn't know that when he enters college he must go back and make up credits. An engineer can finish his training in four years usually, although in some universities it takes five years. Even when one decides to be an engineer there are so many kinds—civil, mechanical, electrical, aviation—it isn't quite clear as to what one will really do. Because it only takes four years to finish, engineers are not required to be as intelligent as doctors. If I should find that I can't get the work of pre-medicine this could be a good reason for considering engineering as an alternative.

Neither of these occupations is a definite choice. I have decided that these are good fields and I should consider them. Even this uncertain choice is a recent one I don't remember that I had any serious choices in high school. We were asked several times to make choices and I put anything down that came into my head to avoid being different or pressured. One of these choices was medicine but I wasn't serious then One problem for me is that I don't know enough about myself compared to other people of my age.

If I enter medicine I expect to make about $5,000 the first year while I'm getting started. Because there are better chances in larger cities, and I would practice in such a city, in five years I should be making between $10,000 and $30,000 a year if I am good. Engineers do not make as much as most doctors. If I entered engineering I would expect to make about $4,000 my first year, if there were no depression. In five years I would expect to make $8,000 to $10,000 a year. In medicine my peak earnings might run over $30,000 a year if I was lucky. In engineering my peak might stay below $15,000 per year.

I don't think my past vocational experiences will have any bearing on my final choice. My hobbies and spare time activities haven't been important either. I like athletics but I'm only fair in sports I like to read and have done pretty well in writing English themes and for my high school paper. I haven't been interested enough to go out for the University paper. I like moving pictures, dating, and dancing, almost anything which lets me be with groups of others my age.

I don't know too much about my aptitudes and abilities.

Because of my high school and first semester grades I assume I'm at least average in I Q. In high school and so far in the University I haven't had much opportunity to study myself and my aptitudes. As I have pointed out earlier in this paper I haven't discovered any important interests which would be useful in making a choice of an occupation or the professional education I should have.

In the list of job families given me for writing this paper I can't find any particular one which makes me excited Because of the reasons I have given for medicine and engineering the following are as good as any

1. Occupations involving technical or scientific work such as engineer or doctor.
2. Occupations involving social service activities such as teacher or personnel worker
3. Occupations involving executive responsibilities such as business executive.

The personality traits which I have which might be useful to me in earning a living are my interest in the problems of others, my attempts to be sincerely friendly with other people and my tendency to finish things I start.

Counselor Jones, following his established habit of setting aside ample time for digesting folder material before seeing his cases, read that of Williams carefully the morning of the day the first interview was to take place. Because of his professional training and long experience, he integrated the data quickly, kept in mind what seemed to him pertinent items, so that he would not waste time asking Williams to repeat information already in the folder, and mentally marked out the gaps which might be filled in by interview, tests, or other means. As part of Smith's training as a graduate student intern, Jones asked him to go over the Williams case thoroughly and set down the questions that occurred to him. To these Jones responded not with answers but with additional questions of his own addressed to Smith as follows:

	Smith's questions	*Jones's questions*
1.	What are the academic standards of the high school Williams attended?	How would you validate Williams' high school course grades?
2.	What significance is there to the differential pattern of course grades?	Could teacher differentials account for this pattern? Or is there a difference in "difficulty" among subjects? Or do the only real differences arise in the students?
3	Which is usually (always?) more significant, grade average or standing in class?	Why should one be more significant than the other? Should we use both? If so, why?
4.	What are the major factors used by the teachers in this high school in grading?	What are the variables high school teachers in general use in grading?
5.	Does size of the high school have any bearing on grading?	If a difference occurs, do larger schools give higher grades or vice versa? Is grading in a school consistent from year to year?
6	Specifically what is the meaning of an A grade? a B grade?	What does "failure" or F mean? Always or usually the same thing?
7	How reliable are Williams' grades in this university for last semester?	Do any of the departments in Y determine grade reliability? Are grades the same from one to another?
8	How valid are his college grades?	Is it difficult to validate college grades? How would you design an experiment to validate college grades here at Y?
9	In other universities like Y with 12,000 or more students do lower division classes tend to be large lec-	Do class size and method of instruction affect grading? type of exams? Are W's classes at Y like or strikingly

Smith's questions (*Cont.*)	*Jones's questions* (*Cont.*)
ture ones? What size were Williams' classes? Were they lecture? quiz? lab?	different from his high school classes? Has he been taught how to meet these differences? How?
10. Do W's instructors use an absolute grading scale or normal curve?	Should the "normal curve" be used on freshmen? Why? Upper division students? Why? Graduate students? Why? If your answer is "no" to any of these, does this mean that no curve of distribution should be applied in college courses? If it should be applied, how do you adjust it to a given population?
11. Are W's grade differentials in Y due to his performance? To his instruction? To chance variation in the abilities of the students with whom he has been competing?	Could W raise his grades here by picking courses in which less able students are enrolled? Is there any method by which he could pick such courses consistently or by which he could choose "high" grading instructors?
12. Are the results on W's early Binet and Otis tests significant?	Who gave them to him? What difference would it make?
13. How and by whom were the Otis and Ohio group tests administered?	What difference would it make? What questions would you raise about the way the results are recorded?
14 Is it correct to use I.Q. with the Otis tests?	Why? What are the limitations of the I Q? Does it apply to college age?
15 On what population was the Ohio Psychological Test standardized?	Is Y's population comparable? Has this test been compromised? How could it be?
16. Do tests such as the Ohio	What are the chief factor

Smith's questions (*Cont*)	*Jones's questions* (*Cont*)
and Otis predict equally well for all colleges and universities?	loadings in the Ohio? What differences do these make?
17. What assumptions does the high school make concerning colleges and universities when it reports academic intelligence test scores to them?	Good question—what do they assume? Are the assumptions well founded?
18. Do high schools usually have any theory of mental organization behind their testing programs?	What theory do you assume they have even if you find little evidence that they know they have one?
19 Should those who use academic intelligence tests for placement necessarily have any particular theory of mental organization in mind?	Probably, but why? Does the use of other ratings for placement also demand such theories of mental organization?
20. How comparable are the Ohio Psychological and American Council Psychological examinations?	Break this down. Compare by content, vocabulary, degree of difficulty, norms used, validating and reliability processes
21. Why are there such differences between local (such as here at Y) and "national" norms on the ACE?	How valid are our local norms? How valid the national? What references will give you ready answers on the latter?
22. Can you compare one test's results directly with another?	What statistical procedures would produce equivalence tables? Can comparability be found clinically? Why or how?
23. Are local over-all norms sufficient or should we do further subnorming?	Why? How prevalent is subnorming in colleges? How often is local subnorming necessary? Why?

Smith's questions (Cont.)	*Jones's questions (Cont.)*
24. Why does Y use the Co-operative instead of some other test battery?	When you have lined up all the reasons, can you rate them on logic and validity?
25. Are the local Y norms in keeping with W's first semester grades?	If there appear to be marked differences, to what factors will you attribute these? What experimental design would you follow to test your answer?
26 Can achievement tests be used as a cross check and validator of the academic intelligence test results?	If your answer is yes, which ones? Why?
27 Why does our counseling center include a clerical aptitude test?	Should we include some for mechanical ability? Others?
28 Are academic intelligence tests administered individually more valid and reliable than group tests?	Why should they be? Are there crucial studies reported on this point? How would you design an experiment to give a clear answer?
29. Are interest and personality inventories easily falsified even by naive students, as rumor says they are?	What is the research evidence? By what methods could our Y psychometrist ensure honest responses?
30 What are the major methods by which Dr. Jones will try to diagnose W's educational-vocational *interests*?	Assume I use three—how do they compare in validity and reliability?
31. How valid and reliable is the Strong Vocational Interest Blank?	How do its reliability and validity compare with those of standard academic achievement and intelligence tests?
32 Are there any major weaknesses in the Strong Blank?	Sure, there are in all tests What ones are there in this? What in the Kuder Preference Record?

	Smith's questions (*Cont.*)	*Jones's questions* (*Cont.*)
33.	Are there other equally good interest tests?	What are the criteria of excellence in an interest test?
34	Why, in a vocational interest test, are nonoccupational scores given, such as Interest Maturity? Masculinity-femininity? Occupational Level?	Do these alter the scoring on the strictly occupational keys? If so, in what ways? What is the research evidence concerning the value and importance of these scales?
35	Are interest scores of value in other aspects of counseling than with vocational problems?	Can they be used as clues to personality structure? attitudes? value dominants?
36.	Should I ever use or interpret Strong interest scores without reference to the nonoccupational scales?	I would not Why?
37.	Why does Dr. Jones say he will use the occupations for which he has scores only as examples of the field-level concept?	Did I say that? Did I mean it? If so, why?
38	What is the magnitude of relationship between measured interests and measured academic achievement?	Find it and express it as a coefficient of correlation. Can you answer the same as between claimed interests and achievement? between observed behavior and achievement?
39	Dr. Jones has a comprehensive library section on measured, estimated, and claimed interests I wonder which book I ought to own?	I have five basic ones. Give me your list and see if it agrees with mine.
40	Are medical and counseling ethics as to the inviolability of confidential	What are these medical ethics? counseling ethics? Do the principles controlling the re-

Smith's questions (*Cont*)	*Jones's questions* (*Cont*)
information in such agreement that I can get all the medical findings in W's case from the health service?	lease from the Y health service to us also apply to W's private physician? If either will give us reports, will they do so in writing? orally? Why?
41 Are the relationships between the counseling center and health service here good? Why?	Answer this for yourself in terms of (*a*) policies, (*b*) regulations, (*c*) specific procedures
42 If Dr Jones finds that W needs psychotherapy on emotional problems would these relationships be changed?	What techniques of referral would I use? What reports back to me could I expect? Are there any data on W I should send to the health service psychiatrist?
43. What items *re* W's family are significant?	Which of these require further probing? What clinical inferences do you draw from them?
44 What relationships can be defined between major items about W and those about his family?	Can we express any of these relationships — father-son, mother-son, father-mother, siblings—as coefficients of correlation?
45. What additional information do we need about W's family?	Should you probe for it? If so, how can you tell when and by what approaches to probe in the interview? What other methods can you use to get the information?
46 If I use direct observation with W, must I make allowances for his age in interpretation?	At what age and educational levels can the best observational records be obtained? the poorest? Why? How?
47 The personality rating scale looks to me like a	It could be If so, what rules for construction of rating

Smith's questions (*Cont.*)	*Jones's questions* (*Cont.*)
rank amateur job. Am I wrong?	scales have been violated? Where will you look for these rules? What are the best references? Why?
48. Are there any items in the rating scale usable in W's case?	More important is, what is left out that we need? How about the Allport-Vernon Scale of Values? the Bell Adjustment Inventory? the Bernreuter Inventory? Minnesota T-S-E? Minnesota Multiphasic Inventory? the Rorschach? Are there any indications that any or all of these should be given to W? What are the major differences between self-rating scales (inventories) and scales rated by others?
49. In what major ways are personality rating factors related to other data?	That is an important and difficult one. Where will you find the answers?
50 What are the values for counseling in W's autobiography?	What researches led us at Y to include the autobiography as a counseling tool?
51. How good is this particular autobiography?	Is it structured or unstructured? What are the advantages and disadvantages of each? What is the evidence? Where is it found?
52. Why was this autobiography written in the English department?	What are the advantages and disadvantages of having it done there? In what other ways might our counseling center get this material at Y or any large university?
53 What are the basic and essential problems of W?	How will you line these up and put them in order of

Smith's questions (Cont.)	*Jones's questions (Cont.)*
	importance? Can you be sure the critical ones, if there are any, are revealed by the data now in the folder?
54 How will Dr Jones structure his counseling of W?	What evidence do I have that I should use Rogerian techniques? mildly directive? strongly directive? What are the major omissions in the present data? Can these be filled best by interview with W? with others? by further tests? observations? an amplified autobiography? referral, and if so, to whom, for what?
55 What stereotypes of interpretation and counseling techniques does this case of W suggest?	Are we in danger of oversimplifying this case? Is it simple? Is it more complex than it seems? How shall we avoid stereotypes here?

Counselor Jones employs this method of asking more questions instead of giving answers, glib and ready, to Smith's questions because he is convinced of the soundness of this technique of training his counseling interns When Smith seems a bit baffled by it, Jones cites the passage in Wendell Johnson[2] in which he elaborates on the cardinal principle that in science clear answers can be had only by asking clear questions. Jones himself, out of long training, out of experience with many counselees, out of keeping abreast of the literature, out of carrying on his own research and directing that of others, would experience little or no difficulty in giving many of the answers or indicating where the answers may be found Since he has worked at Y for a

[2] Johnson, Wendell. *People in Quandaries.* New York: Harper & Brothers, 1946. Pp. 52–57.

number of years he knows also many of the related factors, such as a quite intimate understanding of the administrators and faculty members at Y and the idiosyncrasies of persons and departments in the health service and elsewhere on the campus. He has an insight into local student mores. He is, in general, well acquainted with the curriculum and the extracurriculum. He is familiar with the organization and operation of the "machinery" of the university as well as with its policies He has a wide direct and indirect acquaintance with occupational information concerning professional and nonprofessional job outlets for college-age people.

But Smith is a neophyte. Jones likes and respects him and wants him to attain the competence he assumes he is capable of attaining. Therefore, by his questions, he hopes to send Smith in quest of answers to all the questions and to have him learn the necessity of using all the tools of the counseling trade, including psychometrics, statistics, occupational information, rating scales, personal documents, academic and work records, the interview, sociometrics, semantics, projective devices, and all aspects of the systematic case study. He further needles him gently to learn to make sure that each is used in the right way at the right time and within its limitations.

Some of the answers will be found in the next step taken in this illustrative case of Joseph R. Williams, which will be counselor Jones's interview with him. Dr. Jones has already winnowed a mass of data, some of which he found relevant and some not. He has clarified his own thinking to a degree by asking the questions of Smith. He has tried to avoid stereotyping or anything else that might lead him to prejudice the case before the interview. He has too often seen himself fail or be faulty in counseling by jumping to conclusions as to problem areas from the raw data in the folder before seeing his counselees. However, his careful but rapid reading of these data have helped him to set up some tentative problem areas to explore in the interview

and these he intends to examine carefully both to delimit them and to discover their depth. He knows that if they are superficial a single interview may be enough. If, however, they go deep it may take twenty or more interviews, much supplementary testing, and perhaps referral to one or more other clinical workers. At this point, the reader may find it worth while to summarize for himself the materials and the questions concerning Williams and to hazard a tentative estimate of what Dr Jones will find in the interview before going on to the next chapter dealing with the counseling process.

Chapter 10. A COUNSELING INTERVIEW: SOME IMPLICATIONS

Counselor Jones has just completed a last inspection of Williams' folder. At ten o'clock Williams is due at the office for his conference. Jones is taking the last few minutes to organize and structure this interview in advance. The case history folder indicates to Jones that he is dealing with a student of around average academic ability at the college level, who has been a good high school student and a fair performer in the university for one semester. The autobiography, plus the interest inventory scores, seem to mean that there is no strongly entrenched vocational goal established. There is little evidence, pro or con, that emotional adjustment will enter the picture as a major factor. On the surface Williams presents a very usual problem, that of a student seeking to clarify his educational-vocational objectives in college and after.

If Jones were to take time to make notes on what he hopes to learn from Williams through interview techniques, his outline would look as follows:

Nature of the personal problem and attitudinal sets regarding
- *Emotional condition* (present) and general emotional stability
- *Social adjustment* to college, community, and home
- *Educational planning* in view of capacity, interests, and motivations
- *Vocational planning* in view of capacity, interests, and motivations
- *Religious, moral, ethical outlook* in terms of personal philosophy

Educational-vocational interest pattern[1]

Strong Blank	*Kuder Preference Record*
Scientific	Mechanical
Technical	Scientific
People and personal relations	Computational
Welfare	Persuasive
Business contact	Literary
Business detail	Musical
Verbal-linguistic	Artistic
Occupational level	Social service
Interest maturity	Clerical
Masculinity-femininity	

Aptitudes[2]

General and specialized academic, mechanical, social, clerical, musical, artistic, motor

Abilities (present skill levels)

In the same areas as for aptitudes

[1] Darley, John G. *Clinical Aspects and Interpretation of the Strong Vocational Interest Blank* New York Psychological Corporation, 1941

Kuder, Frederick, *Manual for the Kuder Preference Record* Chicago. Science Research Associates, 1948.

Strong, Edward K , Jr *Vocational Interests of Men and Women* Stanford University, Calif.. Stanford University Press, 1943. Pp 412–482

Super, Donald. "The Kuder Preference Record in vocational diagnosis," *Journal of Consulting Psychology,* 1947, 11 184–193.

[2] Dvorak, B. J. *Differential Occupational Ability Patterns* Minneapolis University of Minnesota Press, 1935 Employment Stabilization Research Institute, Vol. 3, *Bulletin* No. 8.

Paterson, Donald G , and Darley, J G *Men, Women, and Jobs* Minneapolis University of Minnesota Press, 1936.

Paterson, Donald G., Gerken, C. D., and Hahn, Milton E *Minnesota Occupational Rating Scales.* Chicago: Science Research Associates, 1941

Stead, W H , Shartle, C. L , *et al* *Occupational Counseling Techniques.* New York· American Book Company, 1940.

Trabue, M R. "Occupational ability patterns," *Personnel Journal,* 1933, 11 344–351.

General personality integration[3]

Social maturation

Interpersonal relations—siblings, parents, intimates

Extraversion-introversion tendencies and areas

Consistency—inconsistency

Value systems

Semantic and verbal symbolic structuring

Balance

Figure-ground dominants, conditioning, canalization

Attitudinal sets which affect the personal problem pattern

Health attitudes, physical, mental, self-sufficiency, dependence

Submission-aggression-withdrawing pattern

Maturity level of personal philosophy-religion, ethics

Masculinity-feminity

Life goals and their relative importance in terms of idealized image of self[4]

[3] For this and the following section on life goals see especially.

Allport, G., and Vernon, P. E. *Manual for the Allport-Vernon Scale of Values* Boston: Houghton Mifflin Company, 1931

Bell, H. *Manual for the Bell Adjustment Inventory* Stanford University, Calif.· Stanford University Press, 1938.

Evans, Catharine, and McConnell, T R. *Manual of the Minnesota T-S-E Innventory* Chicago. Science Research Associates, 1942

Hathaway, S., and McKinley, J. C. *Manual for the Minnesota Multiphasic Inventory* New York. Psychological Corporation, 1943.

Horney, Karen. *Our Inner Conflicts* New York· W. W Norton & Company, 1945.

Johnson, Wendell. *People in Quandaries* New York Harper & Brothers, 1946

Murphy, Gardner. *Personality A Biosocial Approach to Origins and Structure.* New York Harper & Brothers, 1947.

[4] Child, I. L. "The use of interview data in qualifying the individual's role in the group," *Journal of Abnormal and Social Psychology*, 1943, 38 305–318.

Combs, Arthur. "Some contributions of non-directive methods to college counseling," *Journal of Consulting Psychology*, 1945, 9 218–223.

Cooperative Study in General Education, American Council on Education, Chicago. University of Chicago Press.

Darley, John G. "Use of interest and aptitude tests in counsel-

Security
Service to others
Personal satisfaction
Financial rewards
Power over others
Prestige

Counselor Jones is quite certain that he cannot arrive at valid and reliable answers to these highly personal questions by a direct question-and-answer method alone. Experience has taught him that the natural reserve of the counselee often will cause a covering up of real attitudes, beliefs, and feelings until sound rapport has been established. He, therefore, suggests to himself the many tools and techniques he may want to use as the case proceeds. He reminds himself that the interview must be a learning situation if the counseling is successful

The buzzer is sounded by the receptionist and Jones rises and goes to the door. To the casual observer there is nothing planned for effect in the counselor's behavior for the next few minutes Actually, Jones is very careful to employ certain small, but important, social usages as he greets Williams He meets him at the opened door instead of sitting behind the desk and saying, "Come in." An unstrained smile and handshake accompany the "Glad to see you." Williams is offered a comfortable chair Jones seats himself nearby, and without the desk between them, thus avoiding the symbolism of boss and hireling, of superior and inferior Instead his chair is beside the desk within easy reach of the case folder and other materials. He offers Williams a cigarette and comments casually on a recent basketball game and a new university building which is being constructed.

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ing," in Strong, Edward K, Jr. *Vocational Interests of Men and Women* Stanford University, Calif: Stanford University Press, 1943. Pp 457–482

Rogers, Carl. *Counseling and Psychotherapy.* Boston. Houghton Mifflin Company, 1942.

At the same time he studies Williams. Personal appearance and grooming are good. There are no outward signs of overtension. Williams joins in the small talk easily and appears relaxed. Jones chats informally for a few moments and then, because Williams appears to be waiting for a cue as to the next step in being counseled, asks, "Things bothering you?" Williams says, "Sure, that's why I came" He repeats briefly what he had stated to the receptionist and in his autobiography. His problem is one of educational-vocational indecision. He talks for a short time and then sits back waiting for another cue.

Jones lets the silence last for half a minute and then asks, "Did it bother you to take so many tests when you entered the university?"[5] Answering "No," Williams opens up with a series of questions regarding what he calls the "grades" he got on the various tests. Jones discusses each of these instruments briefly but carefully and interprets Williams' results in generalized terms. But, he does not give the actual raw or scaled scores to the counselee.[6] It should be noted that, in his outline of items of possible importance, *social adjustment* was the second item with *emotional adjustment* first. Jones opened the interview by attentively listening and giving Williams the chance to carry the talk in any direction he chose. Williams did not move in either the social or the emotional direction. Instead he turned the conversation at once toward his educational-vocational problem This could be because he is feeling his way toward accepting or rejecting Jones, because he does not feel secure enough to go into these matters, or, equally possible, because he has no serious social or emotional problems. Thirty minutes of Williams' allotted hour have passed and a second silence comes.

[5] Muench, George A. *An Evaluation of Non-directive Psychotherapy.* Stanford University, Calif · Stanford University Press, 1947. Pp. 157–158. *Applied Psychology Monograph* No 13.

[6] Darley, John G *Testing and Counseling in the High-school Guidance Program.* Chicago Science Research Associates, 1943. Pp. 140–185

Jones now attempts to stimulate Williams to talk about how he is getting along in the university and how he likes it, feels about it. Williams talks easily but briefly and again dismisses this area. He says he is satisfied with the university, puzzled about where to go from here What about social life? Fun, nice companions, all to the good, in moderation What about fraternities? Fine. Williams has had two bids but decided to think it over for the first semester. He might join one before spring Girls? Nothing serious. One at home with whom he had gone in high school A couple on campus who dance well and are good companions at parties.

Time is running out. Jones feels that Williams likes him and that the results of this first interview are satisfactory. He then swings the interview toward still unanswered questions about his educational-vocational plans, remarks that it is something that cannot be settled in a day He asks Williams if he would like another conference. Williams appears pleased They set a tentative time. Jones arranges with the receptionist to make the appointment before Williams leaves. In the five minutes before he must review the folder for his next counselee, Jones dictates the following summary of the interview:

February 24, 10 A M.

Joseph R. Williams, freshman, fall, 19___. Stated problem educational-vocational indecision Self-referred Personal impressions good Well-groomed, poised, talks easily, no observable pressures operating. Second interview scheduled for ____________________ Additional information desired (if Williams is willing).

Minnesota Multiphasic Inventory,[7] *Bell? Bernreuter?* reading test, life goals rating, self-rating on aptitudes and abilities.

Achieving slightly below expectations academically. Probably not serious at this point.

William Jones, Counselor

[7] Hathaway and McKinley, *op. cit.*

The first interview has established considerable rapport. It has given the counselor an opportunity to make observations and pick up impressions which help him to see the case history data attached to a live student, a person. This first hour gives no indications of emotional or social disturbances but, if Williams is willing, a personality inventory may make this impression a certainty or correct it. The hypothesis that Williams is achieving below expectancy calls for further data in the form of a rough but fairly effective test of speed of reading and comprehension.

Some High Points in the Interview

Because of the many semantic disagreements among and between the proponents of various types of interview therapy, it seems profitable at this point to consider the manner of approach used by Jones. The counselor described here uses an eclectic interview approach. He is neither "directive" nor "non-directive" beyond the point of keeping the interview within time limits imposed by work load and budget. In general, Williams was permitted to discuss what he wanted to discuss with a great degree of latitude, and Jones was permissive in his behavior.

On the other hand, Jones is in a position where a preliminary diagnosis is necessary. We speak of *diagnosis* here as any interpretation of the accumulated data. It is an essential analysis of cause and effect upon which a counselor may base his further therapy. It is a drawing of general clinical inferences upon which he can decide to refer the case to others or not. It is not necessary or particularly desirable that Jones apply a name to the problem syndrome he discovers. His preliminary, general diagnosis can be demonstrated in the form of questions and tentative answers.

1. Do this counselee and his problems fall within my competence? (Yes.)

2. Are there symptoms of serious lack of adjustment in any of the problem areas? (No)

3. Is there need for depth or other special therapy? (No)
4. In terms of the limitations imposed on the counseling center by the university, is this a case which I should handle? (Yes.)
5. Is the prognosis such that I should continue to counsel or should I refer? (Continue.)
6. Does this client need *counseling* or *advising?* (Counseling and advising)
7. Are the case data sufficient to help the counselee meet his problems? (Incomplete)
8. What additional tools and techniques of diagnosis for counseling should be used? (Not yet certain)

Jones is not committed to a single type of therapy, nor are his counselees forced to accept a single approach or else go elsewhere for counseling. He is inclined to believe for the moment that there is no serious immediate problem in Williams' case He feels that he is competent to work with him While he is not absolutely certain of the diagnosis, he assumes that need for extended therapy is a remote possibility. If he were to predict the number of additional interviews necessary for Williams at this time the figure would be two to four at most. This number of conferences is reasonable for the counseling center as it operates at Y University in handling moderately uncomplicated cases The diagnosis above leads Jones to believe that there is no present need for referral to another type of clinical worker such as the health service doctor, the psychiatrist, or the religious or financial adviser. On the other hand, the type of problem—vocational indecision—and the complexity of data which will probably need explanation to Williams takes the case partly out of the academic advising category, thus making an immediate referral to a faculty adviser inadvisable. With Williams' permission, a summary of final decisions can go to the adviser later. Jones wishes more information about Williams in the form of an inventory and a few more standardized tests already referred to He is satisfied at the moment that additional diagnostic tools and

techniques need not be used. This preliminary general diagnosis is very unlike that which a physician makes regarding a physical condition, but the process of reaching tentative decisions about aspects of Williams' problems and their probable causes is still best defined by calling it a form of diagnosis. It should be noted that, while Jones introduced topics for discussion from time to time, it was not a question-and-answer conversation. Williams was permitted to treat each topic as he wished without leading questions or tight structuring by Jones.

Some Notes on Diagnosis

However, *diagnosis is not counseling.* The best diagnostician thinkable is of little use in counseling if the ingenious, reliable, and valid findings cannot be placed effectively at the disposal of the counselee in such a frame of reference that he changes his behavior so that his problems are met through emotional, as well as intellectual, acceptance of solutions which lead to better adjustment. In general clinical counseling, the preliminary, broad, diagnostic steps are needed to meet the questions set forth in the early pages of this and the preceding chapter. These diagnostic steps are needed in all cases counseled. In many cases where educational-vocational problems appear primary, a more detailed diagnosis is necessary before a desirable learning situation can be developed. Let us turn back to the first pages of the present chapter and consider such a diagnosis, following the structure that counselor Jones set for his systematic case study

If we could read Jones's mind as it reflects on Williams' case, our telepathic literacy might yield the following interesting thoughts.

Emotional Condition (Present) and General Emotional Stability

The materials in the case history folder gave no clear indications of a current emotional disturbance or of emotional

instability of long standing. The observational records from high school are weighted positively toward adequate adjustment. The autobiography contained some false and some distorted information, but no bizarre notions were in evidence, nor were there illusionary or delusionary clues. No personality inventory, by that title, was included in the test battery but, under certain conditions, the Strong Vocational Interest Blank can be interpreted to yield results comparable to some of those found in the scores of personality inventories. Inspection of the scores obtained by Williams gives no indication of conflicts in the measured interest pattern for the occupational keys. The nonoccupational scales yielded no scores which are deviate, with the possible exception of Occupational Level. The medical history, brief and sketchy as it is, contains no hint of severe physical trauma that might bring about emotional unbalance. Jones could feel, then, at the beginning of the interview that he is unlikely to discover anything very startling about Williams' adjustment in this area. His original conclusion was not changed in the interview.

Social Adjustment to College, Community, and Home

From the folder Jones concluded that Williams' general social adjustment is probably satisfactory. But he warns himself not to confuse a high degree of extraversion with adequate social adjustment, as many beginning counselors are likely to do. He notes that Williams has participated in a number of clubs and sports. His personal information blank and autobiography indicate that his balance between individual and group activities seems satisfactory. He likes modern music and dancing. The interview yielded "normal" attitudes regarding "dates" and a not too eager outlook toward social groups such as fraternities. His personal appearance and behavior gave indications that he would be acceptable socially. Jones tentatively clears this area of being a major trouble spot.

Educational Planning: Capacity, Interests, and Motivations

Williams has made one major educational decision, that he will obtain a college education. His junior and senior high school records, because they are derived from an academic college preparatory curriculum, have not yielded too much information useful in differentiating ultimate educational-vocational goals. They show that it is probable that he can "go through" college but they offer little evidence as to his probable success or failure in such different fields as business, education, medicine, art, or engineering. As is characteristic of many test records, the results of Williams' academic intelligence tests are partially invalidated because we know so little about how each one was administered and scored. However, because they are consistent, Jones assumes that he can use them if he does so with caution. They tend to confirm the high school grades and the one-semester college record, which show that Williams probably has average scholastic competence as a student in a university which attempts to hold to relatively high academic standards.

The college entrance testing battery indicates that, in those subject areas which are most dependent on a verbal factor, Williams has performed at a relatively high level compared with equally able students at Y University. His weakness in dealing with quantitative data is consistent with his grades in both high school and college. The interest inventory shows congruence between his verbal achievement and his measured interests in verbal-linguistic pursuits.

His vocational planning is not judged by Jones to be so poor as Williams thinks. *No decision* often is a better condition than an *inappropriate decision.* Registration in a general education sequence, which involves a minimum of possible academic backtracking and lost time when transfer to a professional school is finally made, is, in itself, a form of insurance against too dire consequences from earlier indecision or poor educational plans Jones is not too dis-

turbed about this matter of no choice, nor would he be if Williams were nearing the end of his sophomore year.

Vocational Planning in View of Capacity, Interests, and Motivations

Jones is quite certain that Williams is in a real quandary of vocational indecision There are no records of work experiences or hobbies which appear to point directly to sound vocational choice. The autobiography demonstrates that he has both erroneous and fallacious information about the two occupations—engineering and medicine—which Williams has most on his mind at the moment. Certainly Jones will make illuminating and accurate materials on both professions available to Williams These will permit him to be more soundly informed if he wishes to be. His pattern of academic subjects and the grades he earned lead to a tentative conclusion that any scientific or technical field at the professional level is not promising for him While Williams does not give indications that he is highly extraverted as compared to a college freshman population, he is enough so to suggest that he can handle work in the verbal and human-relations fields His major strengths tentatively corroborate this idea

The Strong Vocational Interest Blank scores do indicate secondary interest patterns in a technical field and in the verbal-linguistic area.[8] A weak tertiary pattern is indicated in the welfare and business-contact areas. Perhaps the most interesting point in the interest profile is the high standard score on the Occupational Level scale. If this is a clue to the fact that he has a strong drive toward status and prestige, it may indicate the source of Williams' anxiety about ultimate educational-vocational choices so early in his college career

[8] Darley, John G. *Clinical Aspects and Interpretation of the Strong Vocational Interest Blank* New York Psychological Corporation, 1941

Williams is young. The semester-by-semester grind of completing college is part of the testing ground, the results of which will clarify his vocational choice. Delay of the choice for a year or more may not be particularly damaging to Williams, may, in fact, be the best thing to do. Of course, if he wishes to make an immediate choice he is free to do so, and Jones will give him all possible help in coming to a quick but rational and firm decision. Perhaps if he made up his mind now his academic work would improve although Jones reminds himself that this does not always follow.

Religious, Moral, Ethical Outlook, Maturity of Personal Philosophy

In this area, Jones has thus far drawn a blank. Insight into these personality variables is not easily gained through use of the kinds of data found in Williams' case history folder. Nor could one short interview be expected to open these doors to a counselor unless he were a genius. The autobiography, structured as it is, does not tap this general area. Perhaps another type of autobiography, aimed to open up these aspects of personality, could be drawn from him after rapport has been well established. If Williams continues his contacts with Jones over two or three more interviews, at fairly long intervals, Jones feels he may be able to gather information which will help his diagnosis of this counselee as a whole person.

Financial Status, Present and Near-future

The information here permits certain inferences the validity of which can be checked readily by Jones in later interviews. Assuming correct completion of the personal information blank, the Williams family is in comfortable middle-class circumstances. The father's occupation as a small businessman, ownership of the home, educational level of the parents and siblings, plus the incidental types

of part-time work, all indicate that there is no serious financial stringency. Although Jones cannot be certain, there appear to be no pressing financial problems in the immediate future.

Aptitudes and Abilities

One of Jones's chief aims as a counselor is to have Williams make a reasonably clear, complete, and accurate assessment of his aptitudes and abilities. There are a number of methods by which both of them can together reach this goal. Jones will structure the interviews in the future to make use of the *field-level* concepts.[8] (The fields in which he wishes Williams to make judgments are academic, social, mechanical, clerical, musical, artistic, and physical agility.[9]) Jones's present tentative diagnosis of aptitudes, to be followed by additional tests, autobiographical materials, and interview probing, is as follows.

Field	*Level* (Percentile of norm)			
	1–25	26–75	76–90	91–100
Academic		*	†	
Social		*		
Mechanical		No information		
Clerical		*	†	
Musical		No information		
Artistic		No information		
Physical agility		*	†	

* College freshman Y.
† Men in general

If this diagnosis of educational-vocational aptitudes and abilities is found to be a valid and reliable one, Jones and Williams must then determine cooperatively those curriculums in the university and those vocational outlets in the

[8] For a review of the *field-level* concepts see pp. 205–257.

[9] Paterson, Donald G., Gerken, Clayton d'A, Hahn, Milton E. *Minnesota Occupational Rating Scales* Chicago· Science Research Associates, 1941.

community which will probably be most satisfying to Williams. Williams will make the choices; Jones will contribute his knowledge of the university, the community, and secondary sources of information to which Williams can turn in learning about himself, his chosen occupation, and his environment.

General Personality Integration

So far in the counseling process the data, impressions, and cues with which Jones has to work do not offer a solid platform from which to make diagnosis of this most important factor On the surface the signs are plus, but Jones is cautious. If Williams arrives at a satisfactory solution in three or four interviews, Jones may not even then have reached any conclusions as to his personality integration. If he and Williams become better acquainted over a period of time through further counseling, classroom associations, or informal relationships, a diagnosis in this area may become a possibility Meanwhile he sets it aside If Williams' condition indicated a need for extended psychotherapy, Jones would be much more concerned with the personality gestalt.

Life Goals and Their Relative Importance

Jones assumes that the life goals or desires of his counselees are important They are important for Williams to know about himself, and important for Jones to know in structuring his interview learning situations Jones uses a simple form of psychograph as a teaching device This psychograph includes six areas, or goals, which represent broad categories of personal needs. These are

Security. The desire for a moderate standard and scale of living in the present, job security at a rising level during the work life; and freedom from poverty and dependency in old age.

Personal satisfaction. Vocational and avocational pursuits which yield satisfactions to the individual without income, security, or prestige being stronger drives.

Service to others. Occupational outlets which center about the welfare of society and its individual members Social case work, the ministry, teaching, counseling, and nursing are examples of such occupations.

Prestige. The drive to be looked up to by one's peers and colleagues, to hold positions and perform duties which carry social recognition as an important person An example of this goal is often found among those who wish to enter medicine chiefly because the physician stands so high on the community prestige scale.

Financial rewards The desire for material payments appreciably above those of others in similar socio-economic brackets This goal is loaded with factors relating to *power over others, prestige,* and *security,* but cannot be identified exactly with any one of them

Power over others The desire to command and direct the actions of others This goal is also loaded with *prestige* and *personal satisfaction* as well as others but is wholly congruent with none of them Vocational outlets are armed service officers, police, politicians, executive and managerial jobs

On this psychograph, counselees are requested to indicate which of these goals is most important at the present time and then to rate each of the remaining five as to its relative importance. Only one goal can be indicated as most important. Williams will be asked to fill in this form at the next conference and it will be used as a basis for discussion then or later. Jones recognizes the possibility of significant changes with time in the pattern of goals which Williams will select at present. This, however, does not disturb him, since he knows that the important thing is to have achievable goals and to be struggling toward them Williams can be expected to make shifts in his desires as he grows older. What money he gets, what friends he makes,

and other basic factors will condition his unfolding pattern five, ten, or more years from now.

Recapitulation and Summary

In this chapter the authors have endeavored to afford some insight, however incomplete and elementary, into the counseling process followed by a general clinical counselor faced with a counselee who claims to have educational-vocational problems. A "simple" case was selected to demonstrate that, no matter how simple, there is need for careful diagnosis. It is far better to treat all counselees as if their problems were infinitely complex than to treat a case that is complex as if it were simple. It is hoped, therefore, that a kind of systematic structure of investigation has been outlined and high-lighted so that cases may be reviewed with a minimum of wasted effort. The clinical psychologist working with student problems in an educational institution has always the responsibility for being quite certain that a real problem and its causal relationships have not been overlooked

No attempt has been made to present a completed case For one thing, no case can ever be considered as finished until the counselee is graduated or is out of the purview of the counselor. Williams may find a number of new situations with which he feels he needs help. Another point of importance is that a neatly packaged case in a book of this nature seldom fits exactly any "live" case. There are no neat counseling packages. Further, it is doubtful that anyone can ever *tell* another person how to counsel in the sense that he can tell him how to fry an egg or operate a can opener. It should be evident that the arts, skills, and sciences involved in sound practice of psychology must be had the hard way through instruction, supervised internships, and long practice.

Hence the incompleteness in the case study contained in this and the preceding chapter is by design. With pressures

of time and budget, few counselors in educational institutions will ever be in a position to do a really complete counseling diagnosis even if they are able to do so. The references at the end of the chapter contain materials which should be helpful if the reader wishes to pull together a comprehensive outline of most of the possible facets of a case study.

One of the most important topics dealt with is that of diagnosis The general clinical counselor should keep in mind the following two aspects of diagnosis presented:

1. General diagnosis for the purpose of determining the advisability of continued counseling by the original counselor, and
2. Specific diagnosis for the purpose of analyzing the student's problems so that an appropriate counseling structure can be developed for the individual

Above all, the authors desire to press the importance which they attach to an eclectic interview therapy. It is our strong conviction that successful therapy does not lie in a single direction. The effective counselor in the field of general clinical psychology must have many tools and techniques at his disposal for diagnosis as well as for therapy. The two ends of the counseling continuum—"directive" and "non-directive" interview therapy—are merely extreme types of all the different methods which may be found useful in a particular case with a particular type of problem.

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Chapter 11. PROGNOSIS AND PREDICTION

The two terms, *prognosis* and *prediction*, are used to indicate two related but not identical concepts. *Prognosis* is used medically to indicate the prediction of the course and termination of a general health condition usually in terms of the individual patient. In clinical psychology the term is used in a similar sense to indicate the course and probable termination of faulty adjustment of the individual client *Prediction*, on the other hand, is used frequently by the psychologist to give a statistical connotation. We predict through knowledge of relationships expressed by statistical symbols such as correlations and the fiducial limits of probability. Certain types of individual or group behavior are predicted from the systematically observed behavior of a described group, or norm, under standard conditions which are approximated by the sample of behavior from another individual or group deemed to be comparable to the norm group. When such a process is followed, however, in predicting the future adjustment of an individual, we may refer to it as prognosis.

The psychologist, however, does not have neat, normed situations and standard performances which cover the majority of variables with which he works. One of the major functions of the long and careful formal preparation of these clinical workers is to develop the ability to use experience and clinical insights as substitutes for norms and rigorously controlled samples of behavior. The validity and reliability of the counselor in making clinical prognoses and prediction are essential factors in his success.

The general clinical counselor in educational institutions is also concerned with certain group predictions related to the success or failure of groups of students in the various curriculums to which they may be exposed. Such predictions are useful in the screening of new student generations, in the allocation of individuals to specific educational experiences, in counseling individuals, and in advising high schools, junior colleges, and other institutions which supply proportionately large numbers of new students to the upper divisions of college and university. This type of endeavor is usually designated as *prediction studies.*

Every clinical counselor is continually involved in the process of prognosis and prediction. He cannot escape it. These two words, in simplest terms, mean the forecasting, the anticipating of what the counselee is going to become and to do, in the future, either as an individual seeking better personal adjustment, or as a member of a body of, say, transfer students matched with a norm group. Every counselee comes to the counselor wanting to know, sometimes with mild and often with deep intensity, the answers to such questions as: "Where should I go from here? What courses shall I take with likeliest prospect of success and satisfaction? What occupation shall I train for? in what field? at what level? What are my alternative routes? What road blocks stand in the way of satisfactory achievement? Are these in me? or in the college? or in society? Can I remove them and clear the way without too much effort? What do you think of my chances of success? of giving service? of winning happiness? of making a fat income? of gaining a lot of prestige?" These and many more questions are asked or implied every time a counselee sits down with a clinical counselor to discuss an educational-vocational problem. Thus, the counselor is put upon a very hot spot indeed for, like the doctor and like the weather bureau meteorologist, he must play the role of seer, look into the future, and make forecasts that will prove valid and reliable. Unlike these others, however, he usually keeps his predictions to himself In the last

analysis his own success in the profession of counseling will depend in large measure on the soundness of his foresight. He puts up a constant struggle, as does any other scientist, to take the guesswork out of his prognoses by gathering and weighing all possible factors, by winnowing out items of predictive value for each unique case from those that have little or none, and by checking and rechecking his forecasts against what actually happens in case after case, especially those in which his judgment was proved faulty. His batting average is not published in the papers but is a self-validation leading to better counseling.

The literature in this field is increasingly rich, but the areas still unknown and needing research and exploration are vast It is the purpose of the authors here to give no more than a brief summary of the problems involved in prognosis and prediction, the theories hypothecated to bolster one approach or another, the factors that make it impossible to come even near to absolute accuracy, and to refer the reader to the major reported studies. Most useful to him will be Horst[1] and others, and Crawford and Burnham.[2] These, to which might be added Murphy[3] for a review of basic theories, and the report[4] of the OSS Staff for discussion of many of the difficulties and pitfalls, with the bibliographies and references in each, will serve to launch the reader toward comprehension of the many facets of this highly complex and difficult but essential task.

How one shapes his predictions depends first of all upon

[1] Horst, Paul, with collaboration of Wallin, Paul, and Guttman, Louis *The Prediction of Personal Adjustment* New York Social Science Research Council, 1941 *Bulletin* No 48.

[2] Crawford, Albert B , and Burnham, Paul S. *Forecasting College Achievement* New Haven: Yale University Press, 1946. Part I, "General considerations in the measurement of academic promise."

[3] Murphy, Gardner *Personality· A Biosocial Approach to Origins and Structure* New York Harper & Brothers, 1947. Especially Part II, "Learning," pp. 161–330.

[4] OSS Assessment Staff. *Assessment of Men* New York: Rinehart & Company, Inc , 1948. Especially pp. 395, 454–461.

his philosophic view of man and his personality. This view will be taken from somewhere along a continuum from the notion of absolute determinism to absolute free will. Extreme determinism would make prognosis a cut-and-dried business. If one believes that some all-controlling power, such as a directive god, fate, nature, the position of the planets and the stars at birth and thereafter, dictates every detail of what each human being shall be and do, then prediction is easy. All one has to do is to read horoscopes, manipulate a Ouija board, examine the bumps of the head or the lines of the hand, or stake out the channels along which fate moves. Or he may edge in on "science," analyze the counselee's "conditioned responses," or measure an I.Q., and assume that one or the other gives fixed and unchangeable results and is all-controlling Feeding on this sort of fantasy, he will predict his counselee's success or failure in school and college, on the job, or in marriage. The proponent of an extreme doctrine of free will, on the contrary, will find himself wholly unable to make prognoses of any sort, for he will hold that anyone can be or do anything that he wants intensely enough. Trained clinical counselors assume a philosophical position somewhere in the middle ground—what Murphy,[5] following William James, calls a "soft determinism"

This middle-ground position is founded in a vast amount of research, most of that referred to in this book and great quantities beyond. Despite the fact that human beings vary from one another in a multitude of ways, and each differs from himself from one moment, one day, one year to another, there are many carefully wrought accumulations of evidence that certain dominant inherited factors are present in each one of us; that these cause us to react to ourselves and to our environment in generally definable and comparatively limited ways. This structure tends to shape behavior. There is other evidence that, as we approach maturity, we develop relatively stable value systems,

[5] Murphy, *op. cit.*, section on "Emergence," pp. 643–645.

methods of symbolization, interests, patterns of behavior which become combined into aptitudes, and, with experience, into abilities and achievements. In the broad area of these stabilities lie the concepts of conditioning, of dominance, of figure-ground relationships, of canalization, of persistence factors, of drives, of motivation. In them, the possibilities of refining and improving prognosis and prediction find a fairly firm anchorage.

On this point Murphy[6] has this to say:

> But personality is a continuity, a continuity determined partly by inner forces, partly by impulsions from without, but maintaining a recognizable individuality, a constancy or recurrence of patterned tendencies such as permits the recognition of identity This continuity would be a necessary postulate in relation to all those "dependable" characteristics of which one speaks, such as the "capacity of the individual for adjustment" or the ability to "take" what life presents. Not only must the stability be sufficient to permit carry-over from the test situation to a specific life predicament occurring a week or a month later, it must be sufficient to permit an over-all personality description in terms of a basic and continuing disposition.

However, lest we get too smug about our ability to identify and predict from these "continuing dispositions," Murphy continues with a warning that brings us down to reality and makes us humble about their being wholly solid and accurate.

He says:

> Here, however, we confront a final paradox. Nothing is more certain than discontinuities, unpredictabilities in relation to new and different situations. Even the chemist, with his fine control of his data, no longer speaks of the fixed attributes of Mendeleev's 92 elements, for he knows that at very high temperatures there are hundreds of elements whose properties are unforeseen in classical atomic theory. The human personality can never be so defined as to permit precise prediction in new situations, not because of any necessary arbitrariness of be-

[6] *Ibid*, pp. 84–85.

havior, but because the properties of the new situation have never been brought into the relation with the properties of the organism If the situation is really new, new valences will be called for, untapped possibilities[7] released, earlier assumed adequacies found* inadequate. The individual is capable of a stable equilibrium at one point or in a broad area, but let the situation push upon him in a new way and he may move abruptly to a new and very different equilibrium. If one pushes a chair backward a few inches, pivoting it upon the rear legs, he can remove his hand and the chair will fall forward to resume the old equilibrium; but let him pass by a hair's breadth beyond a given point, and the old equilibrium cannot be regained. The chair falls backward to the floor, to come to rest in a completely new position and with no tendency to return to the old Catastrophic situations,† or indeed *new* situations of any sort, lead to responses showing that, however deep the continuities within a person may be, new centers of equilibrium exist, a new relation with the environment may be established. [Here Murphy returns to a more optimistic view] Much depends, of course, upon the individual's‡ age and experience, his achieved stability.

[7] *Ibid*, Chap 19, "Creativeness," pp. 452–478 Consider also many examples of introverted "timid souls" who have performed deeds of astonishing heroism in combat or hitherto "dumb" and apparently ignorant and limited personalities which, under "new" circumstances, have displayed astonishing and certainly unpredictable insights and "created" powerful ideas, great works of art, luminous literature.

* From his record, as Robert Sherwood points out in his *Roosevelt and Hopkins* (New York Harper & Brothers, 1948, pp 38–39), as an engineer and director of food relief to Europe after World War I, Herbert Hoover, the "Great Humanitarian," might have been predicted to be the solver of the problems of the depression, the creator of the New Deal. Instead, the new circumstances showed that he had not the particular qualities of leadership or the methodology to meet these specific new needs.

† Such as war, loss or sudden acquisition of a fortune, sudden death of a beloved, or perhaps the various Metrazol, electric, or insulin shock treatments in the therapy of psychotics, or recovery from cancer or polio or tuberculosis

‡ Note in this connection Strong's findings that interests are not accurately measurable before approximately age fifteen and that after

It may take a major cataclysm, or only a persistent annoyance, to cause a crack-up, similarly, *any* redirection of the whole person depends both[8] on inner stability and on the force of the hammer blow directed against it.

In our brief review of the philosophical and theoretical bases for prognosis and prediction we should not overlook the contributions of Terman, Sullivan, Burks, Oden, and others in their long and patient studies of genius.[9] Because none of the case studies have been reported in detail as such, we cannot deal adequately with their process of prognosis, but the results are extraordinary in terms of possible predictions about the vocational, educational, avocational, adjustive, marital, and other factors for similar individuals and groups. It is a truly startling demonstration of the kinds of cautious predictions which the competent psychologist can now make. The evidence is heartening testimony to the basic stability and predictability of normal human behavior and adjustment

Within this philosophical and theoretical framework, other researchers have operated in many fields over the past quarter century to develop practical applied techniques of prediction. Studies of mass behavior have centered upon

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that period they tend to change very little. Most of us seem, with age, to settle into patterns making for predictability.

[8] See Grinker, Roy R and Spiegel, John P. *Men under Stress* (Philadelphia. The Blakiston Company, 1945), for full discussion of the variation of the thresholds of resistance to the "hammer blows" of combat conditions among the American Air Forces during World War II, and their presentation of criteria and methods for refining the prognostic and predictive devices for prejudging these thresholds before men are selected and trained for such services. See also the OSS Staff, *op cit*, pp. 102–112, for descriptions of the various tests and projects they used to predetermine the breaking points of their candidates and the degree of tension necessary to upset their equilibrium.

[9] Terman, Louis M., and Oden, Melita, H *The Gifted Child Grows Up*. Stanford University, Calif.. Stanford University Press, 1947.

population and social trends, the business cycle, consumer desires and needs as related to local, regional, and national advertising, production, and distribution of goods and services; forecasting elections; and analyses of the popularity of programs and persons on the screen, over the radio, and now in television. Similarly, prognosis of individual behavior has made great strides. Medicine is now able to forecast the progress and probable outcome of the course of a disease in a single patient with far greater reliability than ever before. The armed services in World War II did a far better job than at any time in history of assigning men to branches of the service and to specific tasks on the basis of diagnosis and prediction of behavior, despite the great mass of men involved. Business and industry have much improved their selective and training processes by occupational, job, and worker analyses and the prediction of potential success of the one in the other. Hazards to the life and health of the individual and to groups have been somewhat reduced by forecasting the "accident proneness" of machine and transportation operators and switching them to less risky jobs. Marriage counselors and clinics, investigating the sources of conflict and adjustment in the family, are becoming more accurate in the prognosis of happy marriages and those headed for the rocks of divorce and desertion And many high school, college, and university researchers are constantly seeking for better tools to discover the aptitudes, interest, and motivations upon which predictions of success or failure in one or another curriculum, or transfer to higher levels, can be based Concerning progress in this field Crawford and Burnham[10] offer the following criticism·

> A successful aptitude test reliably measures qualities essential in successful future performance, by sampling previously acquired skills associated or antecedent to those qualities, but without introducing elements which can only be acquired from

[10] Crawford, and Burnham, *op. cit.*, pp. 4-7.

the proposed future study. Such examinations attempt to forecast subsequent progress by evaluating its known precursors. The child is still the father of the man. . . . Within the field embraced by these definitions, the present undertaking is restricted to the still more limited area which, for convenience, may be called that of measuring *educational aptitudes.* We are here concerned initially with individuals' abilities to acquire, by whatever means, knowledge and skills demanded for specific curricula of schools and colleges. . . . We may take as analogous to so-called "achievement measures" in education . . . various "trade tests" designed to measure an individual's *attained skill* in a particular job or his knowledge of operational processes The corresponding parallel to educational aptitude tests is afforded by instruments designed to measure the (as yet) untrained individual's *potentiality for acquiring* vocational skills —that is, his "teachability" or apprenticeship promise. It is somewhat startling to realize that *capacity to learn* has thus far received greater attention from various business and industrial fields (largely because of its effect there upon operational costs and profits) than from education, whose primary concern it should be. . . It may be noted, however, that academic counterparts of industrial aptitude testing, and even "job analyses" of a sort, at last are gaining considerable recognition even from educators.

These authors, as the title of their book *Forecasting College Achievement* indicates, concentrate their analysis and exposition upon "mental power, in the sense of relative promise for one or another field of study." They make a strong case for aptitude testing in the sense of "differential readiness to learn" as a basis for prediction and as opposed to the all too common achievement tests, which, they say, while giving some indication of a counselee's retention of things learned in the past, "often fail to suggest his promise for other fields to which he has *not* been exposed," and which may, therefore, "sometimes prove inadequate or actually misleading. His strongest intellectual powers may be latent and as yet uncultivated through lack of recognition or opportunity." They hold it essential, therefore, if prediction is

to be even relatively reliable, to make a thorough inventory of every student's every potential ability by means of aptitude testing. They warn against basing individual prognosis solely or largely upon generalized tests of academic intelligence since, however fair these may be for all students of a certain grade or level, they "are too generalized for directional significance" They stress, also, the concepts of differential "primary" as well as "secondary" aptitudes, of unitary traits, of the necessity for combining these into various configurations of educational and vocational significance, the need for the refining of present instruments and the development of new ones, the administration of batteries of such tests, the adapting of these to different regions, localities, and institutions, and the applying of the most expert and careful statistical processes to the results, if prognosis and prediction are to be improved.

Horst[11] and his associates broaden the base of discussion of prediction They focus upon statistical method but strongly stress the case study as a vital element. They also effectively describe the process. They say in part:

> The study of the prediction of individual adjustment affords an excellent opportunity for the development of scientific method in the psychological and social sciences. It involves the theory of probability and all its possible mathematical and statistical applications By means of some of the newer statistical methods, it should be possible to increase considerably the efficiency of prediction. Through the use of case studies it is possible not only to suggest new and better predictive items for further statistical treatment but, often by isolating what seem to be trends of dynamic factors within a given personality, to permit direct prediction for individual cases. The combination of statistical and case study methods . . . should make possible considerable advance in the efficiency of methods of prediction.

Of the importance, both social and individual, of increasing the validity and reliability of prediction, they continue:

[11] Horst, *op cit*, Introduction, pp. 1–11.

> From the standpoint of practical applications in society, better efforts at prediction will be of untold value For a nation or society as a whole to be most efficient and happy, it is important that its members be engaged in the work for which they are best fitted; that men and women be mated so as to achieve maximum marital happiness and family satisfaction, that the amount and kind of education given its youth be adapted to their capabilities, and that the number of its members confined to penal institutions be no greater than is absolutely necessary for the safety of the community . Finally, from the standpoint of the individual, the development of scientific techniques for increasing the probabilities of his making a successful adjustment to his environment has potentialities ample to justify prolonged and concentrated research

It is clear from their further analysis of the problem that the *process* of prognosis and prediction is the same whether it be applied to one or another aspect of man's attitudes, interests, behavior, and activity It consists of five major steps here paraphrased for a convenient check list for the readers.

Step 1. The accumulation, by means of "job analyses" in the broader sense used by Crawford and Burnham, of indices, measures, or criteria of what makes success or failure in, say, the study of chemistry or English or foreign language, or in a given professional or vocational task, such as the professions of nursing, teaching, surgery, or concert pianist, or in getting along cooperatively with husband or wife, is necessary. Such criteria must be described and defined in clear and unequivocal terms which are as specific as possible.

Step 2 The gathering, analysis, interrelating of test and case study factors present in "successful" persons and lacking in "failures." Thus, if it is found in an adequate number of successful teachers of English literature that they have had homes in which there were many books and magazines covering a wide range of material, that both parents were avid readers, that the teacher himself had read widely, had achieved high grades in English courses in high school and in a major in college, had A rating in English teaching

on the Strong Vocational Interest Blank, had achieved high percentiles in speed and comprehension in reading literary materials, had high Persuasive scores on the Kuder Preference Record, had top scores in Theoretical, Aesthetic, and Social areas on the Allport-Vernon Scale of Values, each of these items might be used as a criterion for predicting the potential success of a college senior as an English teacher Many of these data would be of value for predicting academic success for freshmen in a literary curriculum Similar directly related discriminatory items may be found for predicting success in any activity. In addition, it is important to gather and analyze factors[11] that are indirectly related For example, marriage to a wife of similar literary tastes and interests may richly contribute to success in English teaching, whereas being mated to a predatory woman whose chief drive is for high income and social prestige may negate all or most of the main predictive factors. In any case it is clear that a vast amount of background data must be winnowed for prognostic and predictive items.

Step 3. Combining the direct and indirect predictive items to yield a general prediction rating for each individual as compared with the "successful" and "unsuccessful" norm group.

Step 4. Trying out the prediction items on a control group and checking the results.

Step 5. Applying clinically to individual cases these predictive measures, making prognoses, and validating these by all possible means, particularly by short- and long-time follow-up studies (see Chap. 12).

[11] For an elaborate analysis of some of these indirectly related but important factors in predicting job success and satisfaction see Friend, Jeanette G., and Haggard, Ernest A. *Work Adjustment in Relation to Family Background.* Stanford University, Calif.: Stanford University Press, 1948. *Applied Psychology Monographs* No. 16. Also Grinker and Spiegel, *op cit.*, Chap. 4, and their treatment of infantile dependence upon mother or father, "Momism," and other indirect factors in their bearing on the success or failure of personnel in the air forces during World War II

From this brief summary it can readily be seen that the processes of prognosis and prediction involve: (1) casting back into the *past,* analyzing and structuring what can be learned of dominant dynamic trends in the characteristics of both the counselee and the environment in which he grew up and developed, and studying the interplay between him and it; (2) discovering by means of tests, case histories and interviews, and other available techniques his *present* powers, interests, attitudes, levels of achievement, and especially his latent or embryonic aptitudes, plus the determining of how "good" or "bad" his present environment may be—his college, his family, his friendships, his job—as a source for his vigorous development of all these characteristics or as a means of frustrating them and drying them up, and (3), finally, projecting both his personal and situational lines of force, and their probable interrelationships, into the *future,* both in fairly firm, short spans of time and in much more tentative long spans.

The whole study of the individual counselee, of his situation, and of the interrelationships of these, past, present, and predicted future, must be subjected to constant reference to, and control by, statistical operations. Accuracy of prognosis may be increased only by a counselor who is thoroughly grounded in the concepts and application of norms, percentiles, coefficients of correlation, probability and chance factors, means, medians, significant differences, and the rest. Only by employing *all* available and pertinent tools and techniques can a counselor or his counselees have any firm confidence in his predictions. Too many counselors in the past have, out of ignorance or laziness or incompetence, leaned too heavily on single types of instruments such as tests alone, interviews alone (as in Rogerian counseling), case studies alone, or statistics alone. Full combinations of these must be made if the "click" effect of Williamson is to be in reality any more than an emotional, and probably quite misguided, hunch. To avoid this common fault, to improve the accuracy of prognosis and prediction,

the reader is advised to devote continuing attention to the basic literature in the field as suggested in this chapter, to the bibliographies in the references, and to the reports of researches now and in the future in process.

It is clear from all this that in answering the question "How far ahead can we predict?" we must distinguish between the specific and the general. Attempts to predict on specific things a long way ahead into the future must always smack of quackery. Our formula, therefore, is that the more specific the item the shorter is the time for which valid forecast may be made. On broad trends or field analysis one may project as much as twenty-five years ahead and not miss by a very wide margin provided there is no cataclysmic or disastrous event which, as has been indicated, may force almost unbelievable differences in behavior to appear. Even then, the skilled counselor is on the safe side if he casts his long-range predictions in general terms, relates his analysis of an individual to a statistical orientation, and says to himself no more than that the counselee is likely to make a *better* or a *worse* adaptation of himself to circumstances or to suffer little or no change.

In summary, it may be reiterated that there are four basic reasons for making predictions:

1. To improve one's counseling by matching up successes with mistakes in prediction, identifying the causes of both success and failure, and working to eliminate the cause of error.
2. To assist academic advisers in making their advising more effective by refining prediction in short-time specifics so that they may better take the guesswork out of helping students to pick courses and curriculums
3. To increase the efficiency of referral to related agencies for help with counselees.
4. To furnish predictive data to administrators to guide institutional changes in policy, student selection and admission, curriculum building, and the like.

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Chapter 12. THE EVALUATION OF COUNSELORS AND COUNSELING

In preceding chapters attention has been given to the need for research to establish the reliability and validity of tools and techniques of the clinical psychologist engaged in the practice of counseling. In bringing this book to its close the writers believe the final chapter should be devoted to emphasizing again the importance of evaluating not only the counselor and his practices but also the larger gestalts of operation and activity in which he works.

This belief rises in large part from the paucity of comprehensive research and evaluation reported in the literature of psychology. A few outstanding examples of such evaluations are well known. These include the longitudinal studies of Terman and his associates in their studies of genius, the singleness of purpose which has characterized the work of E. K. Strong and Frederick Kuder with measured interests, the Minnesota mechanical ability studies, and the Employment Stabilization Research Institute investigations by the same group. Since 1945, Lowell Kelly and his associates, working with the Veterans Administration and other agencies, have planned and executed extensive research projects which give promise of further valuable insights. However, these and other investigations of comparable scope are the exceptions and not the rule. Even cursory reading of the current psychological journals impresses the reader with the individual and fragmentary research which, while valuable, furnishes us only with pieces

of material that may lead in time to coordinated efforts which will move us more rapidly toward answers we badly need.

Professional groups interested in improving the practice of the clinical psychologist are keenly aware of the impelling need for such coordinated research to bind together, and give larger meanings to, the continued efforts of the individual researcher. Several divisions of the American Psychological Association are pushing over-all and team research activities. The American College Personnel Association directs increasing attention to the evaluation of the counselor's work The National Vocational Guidance Association has interested itself in the assessment of total programs Despite these efforts, professional counselors everywhere, like physicians and psychiatrists, are so swamped with demands for clinical services that evaluation and other research does not move forward as rapidly as we would have it.

Because the general clinical counselor finds his functions so closely tied to both the formal and the cocurricular aspects of educational institutions, it is difficult to separate researches directly concerned with professional counseling practices from those of which the primary concern is the improvement of teaching practices. It is equally difficult to separate program research in student personnel work from that directed to improving the administration of educational institutions. The writers have attempted, in the face of these hazards, to be consistent in their allocation of materials to evaluation and research which bear primarily on the counselor's problems. Some readers will disagree and, perhaps, on sound grounds

Classification of Evaluation and Research

There have been a number of methods for classifying evaluation and research efforts. No one of them has been generally accepted in the area of clinical psychology in which the general clinical counselor operates. There are a number of categorical structures into which research and

evaluation activities can be classified. Froehlich[1] in 1947 presented one approach to categorization of evaluation and research using the headings "External criteria," "Follow-up," "Client opinion," "Specific techniques," "Within-group changes," "Between-group changes." Because of what seems to be an overlapping in these categories the writers use a modification of them in this chapter.

Generalized Program Evaluations

The counselor must operate in terms of the educational philosophy, organization, type of student population, and budgets in his local institution. The general educational climate of the institution and of the community which surrounds it are important factors in determining the quality and quantity of student personnel services which can be offered. The literature is replete with materials which describe student personnel programs in terms of local conditions. We cannot do more here than call attention to some of the more important and typical writings which are devoted to generalized evaluations of total programs. Because the materials are in the main descriptive rather than analytic researches, no experimental designs, in the usual sense of the term, are available. The reader will find additional materials in the bibliography at the end of this chapter.

One of the earliest comprehensive descriptions of a student personnel program in higher education is supplied by Lloyd-Jones.[2] This 1929 publication describes the building and operation of the program at Northwestern University. At about the same time Paterson[3] and his coworkers at the

[1] Froehlich, Clifford P. *Evaluating Guidance Procedures: A Review of the Literature.* Washington, D.C.: Federal Security Agency, U.S. Office of Education, Occupational Information and Guidance Service, 1947 (mimeographed).

[2] Lloyd-Jones, Esther. *Student Personnel Work at Northwestern University.* New York: Harper & Brothers, 1929.

[3] Paterson, Donald G. (and committee). "The Minnesota student personnel program," *Educational Record,* 1928, 9, Supplement 7.3–40.

University of Minnesota presented the elements of the extensive program then being developed in that institution. In 1932 Koos and Kefauver[4] published one of the most comprehensive reviews and analyses of the movement to that time. J. B. Johnston[5] presented telling evidence, at about the same time, relative to the problems of selection and success in academic institutions of higher learning. Although his *Job Satisfaction* was not written in relation to a college or university student personnel program, Hoppock[6] contributed research and other materials pertinent to dealing with young adults in a collegiate setting.

Williamson and Darley[7] combined in their book, *Student Personnel Work*, a how-to-do-it manual, three major aspects of evaluating professional student personnel work: surveys, analytic techniques, and research growing out of the service program. Williamson[8] concentrated on the analytic techniques in a generalized frame of reference, although much of the background for the publication was drawn from his long experience in building the Minnesota program.

As it is not the intention of the authors to devote this chapter to a review of the literature, we omit further consideration of other excellent program evaluations except to mention the group or workshop type of nonresearch evaluation. An example of this is Brouwer's[9] *Student Personnel Work in General Education.* This volume contains a résumé of the findings of the representatives of twenty-two colleges and

[4] Koos, L. V., and Kefauver, G. N. *Guidance in Secondary Schools* New York The Macmillan Company, 1932.

[5] Johnston, J. B. *Who Should Go to College?* Minneapolis· University of Minnesota Press, 1930.

[6] Hoppock, Robert. *Job Satisfaction.* New York: Harper & Brothers, 1935.

[7] Williamson, E. G., and Darley, J G. *Student Personnel Work.* New York. McGraw-Hill Book Company, Inc., 1937.

[8] Williamson, E. G. *How to Counsel Students* New York: McGraw-Hill Book Company, Inc., 1939.

[9] Brouwer, Paul J. *Student Personnel Work in General Education* Washington, D.C . American Council on Education, 1949.

universities who worked together over a period of years. The approach differs in several ways from that used by the authors of other works cited in this section.

The chief value of these descriptive evaluations of total programs lies in their statements as to the methods which yielded workable answers in various local situations. It is probable that we can never transplant a student personnel program from one institution to another without making sometimes drastic changes. Nevertheless, common successful structures in organization, functional allocation of responsibility, patterns of tools and techniques, and job descriptions will help one who is building a new program, or reshaping an old one, to select those aspects which will fit best

Evaluation of Specific Counseling Tools and Techniques

In Chaps. 4 and 5 the tools and techniques of the counselor were considered and a specific bibliography supplied At this point we recapitulate the importance of establishing not only the reliability of tools and techniques in competent hands, but also the even more desperate need for knowing the reliability and validity of counselor X. The literature is singularly lacking in such studies. Not only are experiments difficult to design for this purpose, but also clinical workers are not always eager to have their case work analyzed through research. Although we have labeled this section to indicate research and evaluation of tools and techniques, we might better have labeled it to indicate the need for evaluating counselor competence in their use.

Pepinsky[10] investigated the categories and syndromes of the problems of college students and in so doing also evaluated the amount of agreement among clinical counselors in their diagnoses of student problems through independent

[10] Pepinsky, Harold B. *The Selection and Use of Diagnostic Categories in Clinical Counseling.* Stanford University, Calif.: American Psychological Assocation, 1948. *Applied Psychology Monograph* No. 15.

case-reading techniques. The study indicates that, when diagnosis alone was in question, the counselors taking part had a fair degree of intercounselor reliability. No evaluation of how well these counselors could help counselees to change behavior in desirable directions is included, as the point was not pertinent to his research objectives.

Williamson and Bordin[11] collaborated in a series of experiments which did bear, directly and indirectly, on the matter of counselor validity and reliability, in regard both to counselor agreement in diagnosis and to judgment of the direction of client behavior changes made in terms of follow-up. The usual problem of acceptable criteria of validity was dealt with by general use of the pooled judgments of expert opinion. It should be noted that the references above deal with validation of the counselor's clinical insights into total systematic case studies and not with his efficiency in handling a single tool or technique

The general clinical counselor in schools and colleges is concerned with all problem categories within the nonpsychopathic range, although, as has been stated several times, his major emphasis is directed toward educational-vocational problems Our consideration of the evaluation of counseling would be incomplete if we failed to call attention to research in psychotherapeutic counseling. Snyder[12] has reviewed the significant researches in this field. His materials will be helpful to those interested in research and evaluation

[11] Williamson, E. G, and Bordin, E. S "Evaluating counseling by means of a control group experiment," *School and Society*, 1940, 52 434–440.

Williamson, E. G., and Bordin, E. S. "A statistical evaluation of student counseling," *Educational and Psychological Measurement*, 1941, 1 117–132.

Williamson, E G, and Bordin, E. S "The evaluation of vocational and educational counseling· A critique of the methodology of experiments," *Educational and Psychological Measurement*, 1941, 1 5–24.

[12] Snyder, William U. "The present status of psychotherapeutic counseling," *Psychological Bulletin*, 1947, 4 297–386.

methods in counseling. Muench[13] provides useful experimental design for the evaluation of counseling and certain of its tools, such as the Rorschach test, in his Applied Psychology Monograph No. 13.

Research into the general reliability and validity of the tools and techniques of counseling has been, in the main, fragmentary but voluminous For example, research regarding tests and standardized inventories of various types has developed into a literature of its own. The test manuals are in themselves a huge repository of research findings. Such general sources as Buros'[14] *Mental Measurements Yearbook*, with its more than 1,000 pages of tightly written and selected subject matter, is some indication of how much there is. In the field of interest measurement alone we have such basic publications as those of Fryer,[15] Strong,[16] Darley,[17] and Carter.[18]

The research devoted to the measurement of academic intelligence and achievement has grown beyond the easy grasp of even the best scholars in the field. It ranges from complex factor analysis, represented by Thurstone and numerous others, to simple correlational relationships between a school grade and the score on a test. Personality inventories of the pencil-and-paper variety have also been evaluated with great consistency if not thoroughness. A

[13] Muench, George A *An Evaluation of Non-directive Psychotherapy* Stanford University Calif.: Stanford University Press, 1947 *Applied Psychology Monographs* No. 13.

[14] Buros, Oscar Krisen *The Third Mental Measurements Yearbook* New Brunswick, N J. Rutgers University Press, 1949.

[15] Fryer, Douglas *The Measurement of Interests* New York Henry Holt and Company, Inc , 1931

[16] Strong, Edward K , Jr. *Vocational Interests of Men and Women* Stanford University, Calif Stanford University Press, 1943.

[17] Darley, John G. *Clinical Interpretation of the Strong Vocational Interest Blank.* New York Psychological Corporation, 1941

[18] Carter, Harold D *Vocational Interests and Job Orientation* Stanford University, Calif Stanford University Press, 1944. *Applied Psychology Monographs* No. 2.

glance at a review such as that of Ellis[10] gives one a notion of how much is available.

The experimental designs in much of the research mentioned briefly in this section fall into broad categories, one of which is the determination of relationships as indicated by product moment correlations between original measured status and a later status, between control and experimental groups, and between and among equated groups to each of which differential measurement or therapy has been applied The mass of fragmentary research data cited, and the greater mass not cited here, is not to be conceived as giving evidence that we have explored enough or with great validity. Rather it is a measure of the many problems on which we have not yet made even a beginning In the evaluation of counseling and counseling tools and techniques we need much larger resources than are usually at the command of individuals or individual collegiate institutions It is probable that comprehensive attacks can be made only through organizations such as the American Council on Education, backed in turn by the foundations or by the Federal government. While we wait for this support to eventuate we must continue, each in his small way, to contribute to the needed investigations of a multitude of vexing clinical problems.

Evaluation by Counselees

A very common method of checking the soundness and acceptability of counseling services is through obtaining opinions from those who have been counseled Every clinical counselor is continually made aware of the fact that his counselees are passing judgment on him and his work. He picks up their favorable or unfavorable estimates of him by many indices of acceptance or rejection of his methods, his personality, and the feelings of the counselee regarding the general worth-whileness of the total counseling process as it affects each of them. The cues discernible in the interview situation are often clear cut These cues range from un-

[10] Ellis, Albert. "The validity of personality questionnaires," *Psychological Bulletin*, 1946, 5 385–446.

comfortable fixation on his person, a starry-eyed and emotional eagerness to believe everything he says or is imagined to have said, to complete rejection and stormy denunciation.

Beyond the clues to be had from the face-to-face situation, many others come from the counselees Frequently they recommend, as in the Williams case (see Chap. 9), that their friends seek help from a counselor who has helped them or that they avoid one who has not. The flow of their gossip about counselors washes constantly over every campus and, as one form of assessment, helps to make or break the individual who attempts to serve them. Again, it is by no means unusual for a considerable number of counselees to keep in touch with an effective counselor by occasional visits or by correspondence, sometimes for a few months after the case is presumably closed, sometimes for many years. The authors still receive occasional word from counselees of fifteen or twenty years ago, commenting upon the pattern of their unfolding lives in relation to the analyses made and advice given in those distant interviews

All of this sort of evaluation is casual, unorganized, not very valid or reliable, but, nevertheless, often giving comfort and encouragement to the counselor. At its worst it smacks of the "testimonial" racket, the "James Jones's ulcers were healed in thirty days by our Sorsoothe. It will heal yours" sort of thing. At its best, it produces a preponderantly favorable climate of opinion about a counselor that enables him to keep growing and working to improve his knowledge, insights, skills, and techniques of helping others to solve their problems. McKinney[20] and Bailey, Gilbert, and Berg[21] throw many side lights on the indirect evalua-

[20] McKinney, Fred. "Four years of a college adjustment clinic· I. Organization of a clinic and problems of counselees, II Characteristics of counselees," *Journal of Consulting Psychology*, 1945, 5.203–217.

[21] Bailey, H W., Gilbert, W M., and Berg, I. A. "Counseling and the use of tests in the Student Personnel Bureau at the University of Illinois," *Educational and Psychological Measurement*, 1946, 6:37–60

tion of counseling services by the client. In the studies of Williamson and Bordin cited earlier in this chapter, the method of having clients evaluate their experiences and the counseling outcomes was used Paterson and Clark[22] also discuss the importance of client opinion following exposure to the counseling process

In general the evaluation of counseling by clients is done through such methods as exit or special final interviews, personal follow-up, mail or telephone follow-up, and indirect estimates based upon case load analysis and the number of cases who fail to complete their counseling, with or without verbal explanation. The reliability and validity of such evaluation is not arrived at easily. Nevertheless, it is a method which must be included in research which attempts to evaluate the soundness of a counseling program. The feelings of the counselee about the process are of great importance.

Evaluation by Problem Type

Student counseling, like administrative and instructional services, is tied to institutional budgets. Few colleges or universities can afford a complete counseling service which includes psychotherapy, general clinical counseling, and complete psychiatric attention to students. Even when budgets are relatively large, allocation of staff time must be made within the therapeutic limits to which the program is committed by the general administration. There is little published information on the subject of case allocation budgetwise. Most educational institutions accept some responsibility for the educational-vocational counseling or advising of students. This, in part, is due to the close relationship which such counseling and advising bear to the formal instructional program Students must make choices of curriculums, select major areas of concentration, and choose vocational outlets frequently related to these choices

[22] Paterson, Donald G., and Clark, K. E. "Students' judgments of counseling," *Journal of Higher Education*, 1943, 14.140–142.

The orderly operation of a college or university depends in part on helping students make wise choices of this type

In the experience of the authors at the University of Minnesota, Hampton Institute, Syracuse University, and the University of California at Los Angeles, from 65 to 75 per cent of the problems brought to the counseling center by students can be categorized as educational-vocational. The average number of interviews for such cases fluctuates between two and three for each. Williamson and Darley,[23] Bailey, Gilbert, and Berg,[24] and Hahn and Kendall,[25] support these estimates. Unpublished data from the counseling center, University of California, Los Angeles, also support these approximations. The authors recognize, of course, that "pure" problem types seldom, if ever, exist This problem classification is one of convenience based on the major problem element diagnosed by counselors.

Even though student difficulties centering around social and emotional components are not so numerous as those in the educational-vocational classification, many counselors are quite definite in their estimates of the amount of time needed for clients with such involvements. Estimates depend, of course, on the obligations which the institution is willing to assume regarding psychotherapy. Where counselors work with clients well within the normal range of adjustment, the estimates of average number of interviews needed for social-emotional problems vary from five to seven The range in the authors' experience is from one to over twenty.

This area of investigation is particularly important to the administrator in determining such matters as selection and employment, by type and experience, of personnel, number of counselors, psychometrists, and other professional and

[23] Williamson, and Darley, *op cit*

[24] Bailey, Gilbert, and Berg, *op cit.*

[25] Hahn, Milton E , and Kendall, William E. "Some comments in defence of non-non-directive counseling," *Journal of Consulting Psychology*, 1947, 2.74–81.

technical workers, space and physical facilities, supplies and equipment, budget, relationships with instructional staff, and the general directions in which the counseling program should grow.

Evaluation by Faculty

Counselors must expect at all times to be judged by the faculty of the college or university within which they work General faculty evaluation parallels that of students in that it is based primarily on impressions and scattered incidents and is subject to coloration by favorable or unfavorable emotion and prejudice. There are still many college teachers who tend to view all attempts to help students as "mollycoddling," as "unwarranted intrusion into the private lives of these young adults." They look upon counseling as prolongation of childish dependence They want students "to learn to stand on their own two feet." Some have the illusion that high competence in academic studies inevitably is accompanied by stable emotional adjustment and ability to solve all personal problems, career choices, and the like, with precision and despatch. These continue to view counseling and counselors with a jaundiced eye. At the other extreme there are usually some of the teaching staff who welcome the specialized services as a relief from their own admittedly amateur and inadequate attempts to help students. In between are those who have a dominant interest in their students' welfare, who spend much time in friendly and helpful conferences with them, and who are glad to have clinical counselors to whom they may refer for supplementary expert assistance in much the same way as they refer their advisees to the health service when medical attention seems to be indicated. In addition to these teaching staff members there are always other faculty in counseling itself—the professional associates of the counselors—in medical service, in psychology, in speech, in reading laboratory, in academic remedial work, in nonacademic fraternity, sorority, and dormitory supervision, in financial loan offices,

in disciplinary committees, and the like, who inevitably evaluate an individual counselor on a number of factors, such as the frequency with which he makes use of their services, the sensibleness and clarity of his referrals, his ethical soundness and discretion in protecting confidential information, his skill in handling cases which they refer to him, his observance of social as well as professional amenities, his power to play the academic game within the rules or to violate these with diplomacy and caution when he must for the good of his counselee. While little formal investigation of faculty evaluation has as yet been done, it is clear that an important part of the counselor's answer to "How am I doing?" lies in the opinions, impressions, and estimates of the colleagues with whom he is in frequent contact.

Evaluation by Administrators

One of the most important aspects of evaluation of the counselor and his counseling is that of the president, deans, directors, department heads, and other administrators in the institution where he works. They properly determine whether his salary will be high or low; his budget for tests and psychometric and clerical assistance fat or lean, his physical office and other space large and well enough equipped for all activities or cramped, dim, and tucked away in an almost inaccessible garret or tower, his case load light enough so that he can do a fairly competent job with each counselee, or so heavy that he can give no more than a lick and a promise to each, or neglect many and attend to a few. They can spread favorable reports of counseling among students, parents, alumni, and the public and thus win interest and support, or dry up that support with silence or skeptical comment. Thus in a hundred ways administrators can make the way rocky or smooth, depending upon how they evaluate the individual counselor and the service he gives.

For these reasons, it is essential that clinical counselors continually study the means by which they may help the school and college administrator by furnishing him with

information vital to the solution of many of his complex and difficult problems and to the formulation of academic and other institutional policies A counselor adequately trained and effective can furnish the executive staff with information as to student aptitudes, abilities, interests, and attitudes that is more accurate and ample than can be had from any other source. Upon such data,* policies concerning admission, curricular expansion, extracurricular activities, discipline, and many other matters can be more and more soundly formulated. The authors are convinced that effective counseling supports administrative thinking and decision as nothing else can do. An administrator who *knows,* through hundreds of case studies, thousands of interviews, the ambitions, the qualities, the caliber, the interests of the students under his jurisdiction possesses firm ground for his decisions, is protected from blind blundering, is quite safe from most of the emotional explosions caused by the occasional disturbed neurotic or psychotic student. He has in his hands facts instead of nebulous notions or outworn traditions which have become fantasies in modern education The reader can inform himself further of the many ways in which coun-

* For example, most of the policies of The General College, University of Minnesota, were initially shaped upon tentative studies made of its students by the counseling staff. These policies were modified and made firm by extensive personnel research investigations of the whole college population in one year, and an intensive study of 100 carefully selected samples from among these Both were directed by John Darley and Cornelia Williams of the counseling staff, assisted by a technical advisory committee of counselors and psychologists from other branches of the university The design of this research is reported in the *Technical Outline of the Adolescent Study,* and the results reported in Williams, Cornelia T *These We Teach* Minneapolis: University of Minesota Press, 1943 The authors—MacLean as then administrator of the college, Hahn as then director of the work in vocational orientation and counseling—are fully aware that it was the data revealed by effective counselors which made the process of developing the college sure-footed, enabled it to withstand attack and criticism, made possible the solution of problems of admission, transfer, curriculum building, student morale, etc.

seling supports administration by studying the Minnesota researches on students by Paterson, Williamson, Darley, Eurich, Stone, Pace, and Bordin in addition to that by Williams, those from Columbia by Thorndike and Kitson, those from Chicago by Thurstone and Remmers, from Michigan by Kelly, and from Syracuse by Clendenen, Ostrom, Cottle, and Kendall. In sum, every clinical counselor must be continually aware that he and his work are being evaluated by the administrative staff of his institution and that the development and progress of both are largely dependent upon his furnishing them with a flow of data about students in the mass and individually, data as valid and reliable as he can make them.

Evaluation by Other Counseling Specialists

Froehlich calls this the "expert opinion or Information Please method" An individual counselor or an entire counseling staff may feel that their work is running so smoothly that they grow suspicious that there must be something wrong. Or they may be convinced that the counseling situation is fouled up and they want the advice of specialists to help them straighten it out. Or they may merely assume that it is time for a checkup and seek out the outside and presumably objective experts who can do a sound survey and tell them how they are doing. Williamson and Bordin in a number of articles outline two methods of evaluation by such specialists.

1. A counselor presents one or more cases in detail to a staff conference of his fellow counselors. This meeting is also frequently attended by psychologists, a psychiatrist, a health service physician and other specialists only indirectly connected with counseling. The counselor is judged on the spot by any and all of these. They assess the adequacy of his data, his skill in the use of tools and techniques, the validity of his diagnosis, the soundness of the advice given, the probabilities of his prognosis and prediction being accurate, and the reliability of his interpretation. This

method of putting the individual counselor under fire on his individual cases not only serves to evaluate him and his work but is also considered by many to be one of the most effective means of training. It is widely used in psychiatric training. It is sometimes made even more effective by analysis, in staff conference, six months or a year later, of the same case by the same counselor with full reference to the earlier presentation and discussion of what has happened since.

2. A counselor from within or without the institution independently judges the work of a given counselor by reading with great care his case histories, records, test profiles, and notes, and rating him on the following points (*a*) rapidity of identification of the counselee's major problem in the interviews; (*b*) rapport established as indicated by the attitude of the student toward the counselor and his work; (*c*) the scope and depth of diagnosis, (*d*) extent and adequacy of treatment, including use of referral to other diagnostic and therapeutic agencies, (*e*) completeness of the case record.

Another method occasionally employed is to invite in a crew of specialists from the outside to assess both the counseling service of the institution and the individual counselors and their work. This crew devotes from a few days to a week or two to active study of the system, records, methods, and personnel. Froehlich reports a comprehensive[26] appraisal of the Adjustment Service by a team of specialists. MacLean, in 1942, with Gene Carstater, then Director of the Counseling Service at Hampton Institute, invited Darley, Hoppock, and Feder to evaluate that service. The American Council on Education has made consultants in personnel work available to colleges and universities on the same basis. This sort of outside observation by specialists usually has a double-barreled effect in that the counseling staff to

[26] Coler, C. S, and others. *General Appraisals of the Adjustment Service* New York American Association for Adult Education, 1935

be assessed cleans up and tightens up in preparation for the inspection and plunges with enthusiasm into reorganizing after it is over. In such cases the specialists are not asked to follow any set design and are left free to report their findings in any way they may see fit.

Evaluation by Measurement of Group Changes

Evidence of the success or failure of counseling is most frequently sought by means of short-time studies of changes occurring in a single group of students being subjected to counseling. Froehlich points out that these assessments follow two different designs.

1. The "within-group before-and-after" method in which each student serves as his own control Each student is given a battery of pretests, preliminary interviews, autobiographical assignments, and the like. Judgments are made by the counselor as to the present status of the problems, attitudes, achievements, etc., of the individuals and these are totaled up to give a picture of the group as a whole Then, at the end of the counseling period—a semester, a year, a two- or four-year span—they are subjected to a repetition of the same tests, similar interviews, etc , and the changes in grade-point average, occupational choice, general adjustment, etc , are measured. Thus some appraisal may be made of the effectiveness of the total counseling activity in bringing about desired changes, whatever these may be, and, usually by indirection, the individual counselor may be evaluated in part. Hedge and Hutson[27] evaluated a year's vocations course with 201 high school students and found a significant shift for the better in occupational choice and an increase in the average measured I.Q. Remmers and Whisler[28] found that a group tested on a scale of atti-

[27] Hedge, J. W., and Hutson, Percival W. "A technique for evaluating guidance activities," *School Review*, 1931, 29 508–519.

[28] Remmers, H H., and Whisler, L. D. "The effects of a guidance program on vocational attitudes," *Studies in Higher Education* (Purdue University), 1938, 34 68–82

tudes toward vocations and then subjected to a group counseling process showed some evidence of having abandoned some stereotyping of occupations.

2 The "between-group before-and-after" method which follows the familiar pattern of matching those counseled with those who are not counseled. Stone[29] evaluated a Minnesota course in vocational orientation by comparing a group who had had both the course and individual counseling with each of two groups who had had the one and not the other and with a fourth group that had had neither By excellent design and careful craftsmanship, this crucial study showed clearly, among other results, that students gained more occupational information from the course than from haphazard incidental reading; there was no significant difference in salary expectation brought about by the course; the course alone did not cause students to make more appropriate occupational choices than did mere residence in college, students who both took the course and received individual counseling made the largest gain in optimal choices, whereas those who took the course but were not counseled showed the greatest decrease in optimal choices. This investigation, if corroborated by further researches, may serve to support the assumption that courses in vocational information alone may do more harm than good but that, combined with individual counseling, both may be increased in effectiveness (See Chap 1 and Chap. 5 on the uses of occupational information).

Evaluation through Long-range Follow-up Studies

By far the most wide-ranging and elaborate of evaluation patterns is that of the follow-up study, or what Froehlich calls the "What-happened-then" technique. Most of the methods outlined above are cross-sectional and piece by piece. In contrast, the longitudinal process of assessment

[29] Stone, C. Harold. "Are vocational orientation courses worth their salt?" *Education and Psychological Measurement,* 1948, 2. 161–182.

ideally would follow the behavior and activities of counselees after counseling for the longest possible period of time, the data on these activities being checked against those of the cumulated case history gathered at the time of counseling and against diagnosis, prognosis, and prediction. In the field of personality investigation, which is by no means unrelated to evaluation of counseling, Murphy[30] says, in his discussion of "Continuity,"

> But direct studies of this continuity over long periods of time are shockingly few in number. To mention a few examples of those available. The Harvard Growth Study has supplied numerous (largely unpublished) year-by-year scores on tests; the Grant Study (also at Harvard) has recently begun an intensive longitudinal study of normal young men, The Cambridge-Somerville Youth Study recorded clusters of traits shown year by year by delinquent boys (these data are largely unpublished); masses of data (largely unpublished) of almost every conceivable sort were gathered from a hundred boys and a hundred girls studied during the age period ten to sixteen by the California Adolescence Study, and J W Macfarlane's intensive study of personality development in a large urban group covers the period from before birth to the present (the subjects are in their late teens at this writing, the data cannot be published until the study is completed). Some of these longitudinal studies may begin to be published within a few years

These investigations, as well as the Terman studies of genius just now being reported, suggest the kind of long-time evaluations that should be made of counseling services and of individual counselors despite the obvious difficulties in terms of continuity, of keeping track of individual counselees or groups of them, and of costs in money and effort.

Pace[31] and Troyer and Pace[32] describe a combination be-

[30] Murphy, *op cit*, pp. 722–723.

[31] Pace, C. R. *They Went to College* Minneapolis. University of Minnesota Press, 1941

[32] Troyer, M. E., and Pace, C R *Evaluation in Teacher Education.* Washington, D.C American Council on Education, 1944

tween-group and longitudinal method of evaluating counseling. Pace, as a part of an assessment of Minnesota's General College, evaluated by comparing intensive studies of the patterns of ability, interest, aspiration, etc., of students in college with those of former students who had been out of college for five and ten years.

Froehlich summarizes a considerable proportion of the literature reporting follow-up studies of usually much shorter duration, from one year to eight. The reader is again referred to his bibliography for review of many such direct investigations of the value and effect of counselors and counseling and especially to those by Williamson, Darley, Bordin, Ricketts, Viteles, Kefauver, and Hand. With increasing knowledge of how to design such longitudinal studies, with growing courage to undertake them and to preserve at all costs their continuity, with the development of new and refined statistical techniques, and with the cumulative effect of the reporting and comparing of investigations, we have promise of increasingly valid and reliable evaluation of counseling processes and of counselors.

Counselor Self-evaluation

In many ways, the most important of all evaluations is that made of the counselor by himself, since his internal image, the picture of himself in answer to the question "How am I doing?" will of itself, through its accuracy or distortion, control in large measure his present effectiveness and future growth and development in the profession. This image will be perforce created out of all the fragments of assessment by others, whether these be objective data or subjective impressions. He will blend the reactions of his counselees with reports of his reputation among other students. He will add what he knows of the appraisals of him and his work by administrators, faculty, and professional psychology and counseling colleagues. He will combine these with results of within-group, between-group, and more elaborate follow-up studies of him and his work. And he

will fuse them all into the image of himself-as-counselor by the fires of his own autistic feeling, fiery hot or merely warm depending upon the structure of his own personality. The final result may be a crippling sense of inferiority in the face of the complexity of the job and the recognition of his limitations, "the little known, the unknown vast" It may be an overweening confidence, a sense of superiority, of power "to play God" Or it may be a reasoned humility teamed with a willingness to go on, to learn, to increase skill, competence, and insight, in order that he may help others to help themselves Obviously the latter is the optimum of self-evaluation It can be most surely achieved if, from the beginning to the end of his labors, the counselor demands of himself and others continual evaluation, employs every means of assessment available to him to make it valid and reliable, and trains himself to "roll with the punches," to take and to profit by whatever results may be found.

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